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THE COMMERCIAL CAR JOURNAL

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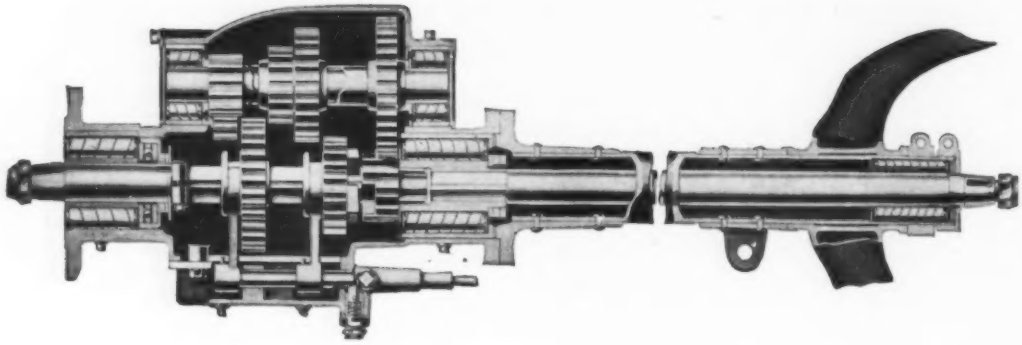
CHILTON COMPANY

MARKET & 49TH STS. PHILADELPHIA

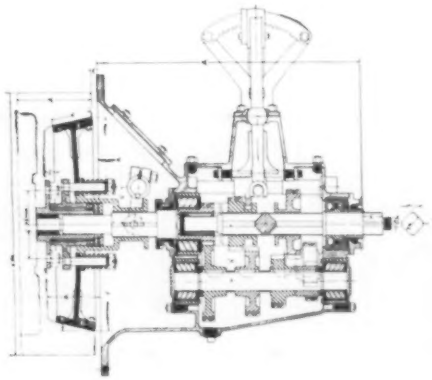
WHY LEADING ENGINEERS USE COVERT TRANSMISSIONS



Many of the leading engineers and designers of the industry use Covert Transmissions in their cars and trucks. Their choice was not a matter of chance.

Confidence in the Covert Transmission has been honestly earned. It is properly designed and as well built as any transmission could be built. Knowing this, designers have found it easiest and most economical to turn their transmission problems over to the Covert engineering corps, where it is handled by specialists.

With every effort of our organization concentrated on transmission building, with a plant equipped with every facility for transmission work, and with a name and reputation which are too valuable to be endangered by inferior work, it is but natural that the Covert standard of quality is appreciated by those who are well informed in this line.



Covert Transmissions are adaptable to every standard type of car design. We are anxious to co-operate with manufacturers and designers of cars and trucks who do not already know the completeness of Covert Service.

Covert Motor Vehicle Co.
Factory - - - Lockport, New York
Sales Office - - - - Detroit, Mich.

THE PUBLISHERS' PERSONAL PAGE

Results Are What Count

The results of the European War to the commercial car industry, have been almost immediate. Even the most sanguine hardly looked for such large orders from the belligerent nations as have already been received. Believing that armored trucks and motor-driven war appliances could not be shipped, many makers despaired of benefiting by the demand which they knew must soon exist for motor-driven vehicles. Government rulings, however, have made it possible for such shipments to be made, those interested running the risk of the goods being confiscated.

Large Orders From Europe

Activity pervaded the plant of one of our well-known steel corporations, through which it was supposed purchases would be made by Europe. Its grounds and buildings, for the past few weeks, might be mistaken for a commercial car show and a motor truckmen's convention. Orders, however, were finally placed direct, 1930 vehicles being purchased by the French, and, in addition, several hundred trailer-tractor combinations.

France Places Large Order

But this is not the end, it is merely the beginning. England, Russia and Greece have also been buying, and it is known that these nations are at this time completing arrangements for large purchases. It is believed that orders for fully two thousand more motor trucks will soon be placed.

Only the Beginning

The truck, tractor, trailer and tire makers will be taxed to the limit within the next few months to supply the demand for vehicles already ordered.

This does not take into consideration the large number that will also be required after the war is over, for the rapid reconstruction and upbuilding of business in the war devastated countries.

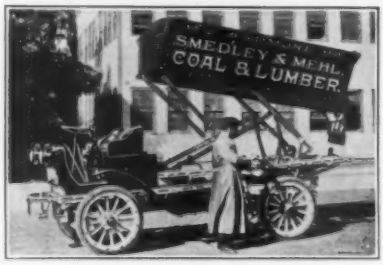
Enormous Demand at End of War

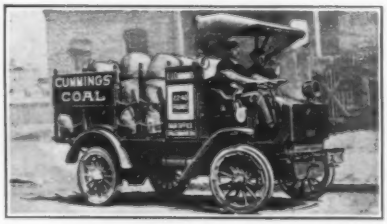
Announcement

of the Advantages and Indorsement of

The Autocar

New Two-Ton Coal Car





OWEN LETTER'S SONS of Philadelphia, one of the largest retail coal merchants in the East, having a yard with a capacity of 40,000 tons, bought two *AUTOCARS* last March — now own four *AUTOCAR* Coal Cars.

They say:—

Repeat Orders

"We found after using *AUTOCARS* a few months that their possibilities of increasing our business warranted the purchase of more."

Increased Territory

"Our delivery territory has been increased at least one-third, and the use of *AUTOCARS* is bringing us business that we could never have secured without them."

Advantages

"Ability to put large quantities of coal into a residence in one day."

"We now take orders at a distance we formerly refused."

"The short wheel base, like a wagon without horses, permits easy turning in narrow places, easy handling in yard and occupies small space in garage."

"Hoisting device permits 24-foot chute — 4 to 6 feet farther than ordinary chute."

"The *AUTOCAR* goes on the ordinary coal scale now used in every yard."

"The *AUTOCAR* is economical in operation and easily replaces three double teams on long hauls."

"We find our AUTOCARS entirely satisfactory from every standpoint."

Any consumer who moves to the suburbs can continue to order from the city dealer who owns an *AUTOCAR* Coal Car. The *AUTOCAR* gets new business and holds trade.

Price of the *Autocar* New 2-Ton Coal Car Chassis

$1850

The Autocar Company, Ardmore, Pa. Est. 1897

Motor Delivery Car Specialists

The Commercial Car Journal

VOLUME VIII | PHILADELPHIA, OCTOBER 15, 1914 | NUMBER 2

SENATE KILLS AUTO AND GASOLINE TAX

The proposed manufacturers' tax on all motor vehicles manufactured in the United States has been eliminated as a result of the storm of protest from Detroit, led by Representative Doremus. The Finance Committee's plan for a tax of one cent on a gallon of gasoline has also been struck out.

It was brought out that should the tax be levied, the manufacturers of automobiles would have to stand the brunt, and many smaller manufacturers would be ruined by it. Their prices are already fixed, and contracts signed with the agents for next year's cars; otherwise they would pass it along to the dealers, who, in turn, would pass it along to the consumers. It was also brought out that the automobile manufacturers have been unusually liberal with their employes.

It was stated that any tax on gasoline would work irreparable injury to independent oil companies.

THE FORD COMPANY NOW SELLS CHASSIS FOR $410, SUBJECT TO REBATE

According to a recent announcement, the Ford Motor Company will furnish a chassis without body for $410, to be fitted by the purchaser as he desires with either a delivery or special body for commercial use. In the past, when a purchaser desired only a chassis, the dealer was obliged to purchase either a runabout or touring car and remove the stock body. This body he was obliged to carry in stock until he found a purchaser for it. The new arrangement should therefore prove of special advantage to the dealer as well as to the purchaser who wants to fit a special body on the chassis.

At the same time the buyer will be entitled to the rebate offered to buyers of their regular models, provided their sales for the year from August, 1914, to August, 1915, reach a total of 300,000. The amount of rebate will probably be $50. This will no doubt increase the number of Fords used for delivery purposes.

THE AUTOMOBILE DEALERS OF DETROIT are up in arms over the order to remove oil and gasoline pumps erected upon sidewalks, and have gotten up a petition signed by business men and citizens in all trades which will be presented to the mayor and council. The order to remove these pumps states that all curb pumps must be removed from curbs by the 16th of October. The dealers and business men claim that it would be hardship to owners of both pleasure and commercial cars, that it would tend to congest even more, many streets which are already congested, and that it is an unfair imposition upon many garages that have no facility to handle a large number of cars.

THE CITY OF HOUSTON, TEX., is making a monthly saving of $1,165.50 by using two motor trucks to pick up street sweepings. Formerly twenty mules were used at the cost of 57½ cents a block, while by the new method of using two motor trucks and ten mules, the cost is only 29 ¾ cents a block. By the old method it cost $65.70 a day to pick up on 114 blocks; by the new method it costs $63.60 a day to pick up on 214 blocks. The cost of sprinkling streets by a motor sprinkling wagon and two motor trucks has been decreased from 20½ cents a block to 15½ cents, making a monthly saving of $442.50. Adding this amount to the monthly saving in pick-up work of $1165.50, the city's new motor-driven street cleaning apparatus is making a monthly saving of $1608.

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Why Europe Needs So Many Trucks

This is a fair example of what becomes of the motor-driven vehicles at the front. Estimates place the number of cars in the allied army at the beginning of hostilities at forty thousand. At the end of twenty-four days, it is claimed that twelve thousand vehicles were destroyed, or at the rate of five hundred cars a day.

S. A. E. ACTIVITIES

The Society of Automobile Engineers will hold its 1915 annual meeting in New York City early in January, during the time of the Automobile Show.

Work of the Divisions

Several of the Divisions of the Standards Committee are now resuming active work, as indicated in the following paragraphs:

Some objection has been made to the S. A. E. permanent metal felloe band for truck wheels, objectors claiming that the thickness is not sufficient for some sizes of wheel. Wheel makers have been asked for their views and the question is being considered.

In addition to the work already in hand, the Truck Standards Division and the Electric Vehicle Division will consider the recommendation of standards with regard to industrial motor trucks.

The merit of the criticism of the lock washer standards made at the last meeting of the Society has undergone some investigation by the Lock Washers Division. A report from the Division is expected on the question of whether the smaller sizes of the S. A. E. standard light series are too light. One manufacturer of lock washers has stated that 90 per cent. of the S. A. E. standard lock washers sold by it are of the light type and found very satisfactory by the automobile and parts manufacturers. It is stated furthermore that the allegation of the very small sizes spreading can be traced to improper heat treatment and that no change in the standard would be justifiable.

Following up the idea of bringing about some uniformity in the fundamental elements of the license pads of cars used in the various States, the Miscellaneous Division has been furnished by the authorities of practically all of the States of the Union data as to the elements of license pads that govern the size and location of attaching devices. The location of the pads is probably of first importance, the width being of second importance, since it is found that the length is dependent on the number of digits in the license pad. Thirteen States require pads 6 in. wide, all but one of them specifying a metal background; ten States require a width of 5½ in., four a width of 5 in., four a width of 4½ in., one 6½ in., and one 7¼ in. If it were possible to harmonize the statutory provisions of the various States to some average width and universal location, the car makers would be relieved of some difficulty and the States assured that license pads would be correctly and clearly displayed.

The Division is also proceeding with a view to recommending a formula representing the destructive effect of motor-driven and horse-drawn vehicles on roads. This subject was introduced in a paper by two members of the Society at its last meeting, at which time a vote was passed that consideration of the subject be continued in committee. Members are requested to transmit to the office of the Society for the consideration of the Research Division their views as to how progress can best be made in the manner mentioned.

Metropolitan Section

The schedule of meetings of the Metropolitan Section is based on the work of its Research Committees, six of which have been appointed to investigate various subjects and it is hoped will be able to report upon the dates assigned. The proposed program is as follows:

October 29—Report of Research Committee on Electric Transmissions. David Beecroft, Chairman.

November 24—Report of Research Committee on Engine Characteristics. Robt. McA. Lloyd, Chairman. Supplementary subject: Eight-cylinder Motors.

December 29—Report of Research Committee on Engine Governors. A. J. Slade, Chairman. Supplementary subject: Magneto versus Dynamo Ignition.

January 28—Report of Research Committee on Greases. H. M. Martin, Chairman. Supplementary subject: Asphalt- vs. Paraffin-Base Lubricants.

February 25—Report of Research Committee on Kerosene Carburetors. A. B. Browne, Chairman. Report of Research Committee on Non-Electric Continuous-Torque Transmissions. L. M. Dieterich, Chairman.

Personal Items

D. A. Johnson, assistant manager of the Chicago branch of the Joseph Dixon Crucible Company, has become manager.

Henry Farrington, well known in the truck industry as editor of the Power Wagon, has accepted a position with the Thomas B. Jeffery Company, of Kenosha, Wis.

William Fewell, formerly Oakland manager at Boston, has been appointed manager of the New York City branch of the Lee Tire & Rubber Company, of Conshohocken, Pa.

Frank H. Trego, research engineer of the Packard Motor Car Company, has resigned to become assistant general manager of the Knox Motor Company, of Springfield, Mass.

Bud Winter, formerly sales manager of the Universal Motor Truck Company, Detroit, Mich., has accepted the position of Detroit manager for the Gibney Tire & Rubber Company, of Conshohocken, Pa.

Fred Harrington, who according to a report in our last issue was said to have gone with the Detroit branch of the Firestone Tire & Rubber Company, which was incorrect, has joined the Detroit branch of the Knight Tire & Rubber Company, as manager. He is no longer connected with the Firestone Company.

Federal Motor Truck Company, of Detroit, Mich., has recently made the following appointments: H. T. Sigealt, advertising manager; R. G. Hargreaves, transportation engineer; C. T. Cary, eastern district sales manager; J. D. Whitman, district sales manager for Michigan, Ohio and Pennsylvania, and Charles Chase, district manager for the Southwest.

Carl H. Clement, until recently chief engineer and sales manager of the Metal Products Company, Detroit, has resigned and is now on the road as sales engineer for the Bock Bearing Company, Toledo, Ohio. Mr. Clement was the first axle builder to test the new Bock taper roller bearing, and his favorable opinion of the bearing has resulted in his becoming identified with the company.

New Incorporations

Drubin Funeral Car Company, of New York City, has been incorporated with a capitalization of $10,000 by the following: Herman Drubin, A. W. Drubin and Alexander Schneeweis.

New Jersey Motor 'Bus Company, of Paterson, N. J., has been incorporated with a capital stock of $50,000 by Louis Cramer, Sr., Louis Cramer, Jr., and John Purce, all of Paterson.

International Motor Wheel Company has been incorporated in Wilmington, Del., with a capitalization of $1,000,000 to manufacture wheels for motor cars, trucks, etc., by H. E. Yatter, W. J. Maloney and O. J. Reichard.

Blair Manufacturing Company, of Newark, Ohio, has been reorganized into a new corporation under the name of the Blair Motor Truck Company for the purpose of manufacturing motor trucks only. The old company will continue in business until its affairs have been settled and the stock of implements on hand has been disposed of.

Pope-Hartford Company, of Connecticut, recently organized to take over the tools, patterns and everything pertaining to the Pope Manufacturing Company, of Hartford, Conn., has taken the name of the Walker-Barkman Manufacturing Company to avoid confusion with the Pope Manufacturing Company, now in the hands of a receiver. The incorporators are W. C. Walker, Ralph A. Barkman and Charles E. Walker.

Automobile Trade Association of Philadelphia Enjoys Outing

The annual outing of the automobile men of Philadelphia, on September 15th, was held at the North Hills Country Club. About fifty attended, being conveyed by cars from the Trade Association's headquarters. Games, including golf, tennis, quoits, and a match ball game between the efficient Sixes and the scientifically balanced Fours, were features. Late in the afternoon all enjoyed a New England clam bake.

First Get-Together Motor Truck Convention of Dealers, Manufacturers and Owners, Held at Detroit, Proves a Marked Success. Many Papers Read and Discussed

ON October 7th, 8th, 9th and 10th, the Cadillac Hotel, Detroit, was a scene of great activity. For the first time in the history of truck manufacture the three vitally interested parties, the dealer, the manufacturer and owner came together for mutual helpfulness.

A large party from New York arrived Wednesday morning in a special car on the Wolverine. The makers of the Central West were well represented and dealers from all parts took the opportunity to get in touch with the makers.

Opening Session

The first session was called to order promptly at 2.30 p.m. Wednesday, by R. R. Spencer, who introduced a representative of Mayor Marx who was unable to be present. After the usual "welcome to our city," President George H. Duck, of the Motor Truck Club of America, made a brief opening address, including the reading of several letters inviting the truck men to hold their convention at San Francisco in 1915. Their letters were from the President and Directors of the Panama-Pacific Exposition, Mayor of San Francisco, Standard Oil Company, Merchant and Manufacturers' Association, of Los Angeles, and from several of the railroad companies.

The speakers were then introduced, the first being Walter E. Parker, of the Commerce Motor Car Company, of Detroit, who read a paper on time payment plans for trucks. The plan as suggested includes the establishing of a Motor Truck Credit Guarantee Association.

An outline of the proposed plan follows:

PLAN
MOTOR TRUCK CREDIT GUARANTY ASSOCIATION
(Proposed)

Purpose

(a) To co-operate with motor truck dealers and manufacturers to mature the existing and tremendous latent motor truck sales field; and,

(b) Through a closer co-operative relationship between dealer and manufacturer, develop and maintain a bulwark of Public Good Will for future mutually profitable business.

Methods

(a) To guarantee and finance deferred payments on purchases of motor trucks.

(b) To discount notes representing such deferred payments.

Proposition

It is proposed that a corporation be formed to be known as the MOTOR TRUCK CREDIT GUARANTY ASSOCIATION, as follows:

The capital to be $500,000. Shares to be $100, par non-assessable.

(a) $250,000 of the subscribed capital stock to be taken at par by motor truck dealers, hereinafter termed "Dealer Members."

(b) $250,000 of the subscribed capital stock to be taken at par by motor truck manufacturers hereinafter termed "Manufacturer Members."

(c) Notes issued for the purchase of new trucks built by "Manufacturer Members" and placed by "Dealer Members" only shall be bought or sold by the Association.

(d) Notes issued for the purchase of motor trucks in accordance with paragraph (c), and according to the following terms only, will be bought or discounted by the Association.

Terms

(a) All trucks sold to the consumer on a deferred payment basis by "Manufacturer Members" or "Dealer Members" alike, shall be on terms as follows:

(b) Upon delivery to consumer one-fourth of purchase price to be paid in cash.

(c) The difference due, or three-fourths of purchase price, to be paid in ten monthly equi-instalments, represented by ten notes upon the correct form (said form to be furnished by the Association), bearing interest at the rate of 6 per cent. per annum.

(d) Aforesaid notes to be covered or secured by conditional bill of sale or a chattel mortgage upon trucks so sold.

(e) Said trucks to be insured against fire, theft and the usual property damages, in favor of the Association (to the extent of its interest).

(f) The notes representing the deferred payments to bear also the endorsement of the "Dealer Member" making the sale and for whom the notes are discounted.

(g) Notes only conforming to the terms above described shall be discounted or purchased by the Association.

(h) The Association shall have the right to refuse any notes offered for purchase or discount when its credit department is dissatisfied with the credit or financial standing of the original maker of such notes, or

(i) When notes already purchased from or discounted for the "Dealer Member" shall have become in arrears.

Notes in payment for used trucks shall not be purchased or discounted by the Association.

Management and Voting Power

The management of the Association shall be conducted by those appointed by a Board of Directors elected from the ranks of the Association by its members, according to the By-Laws of the Association.

"Dealer Members" and "Manufacturer Members" shall be entitled to one vote apiece regardless of respective holdings.

Membership

In order to obtain registered entry into the Association it is essential

(a) That the "Dealer Members" each subscribe and pay in full for five shares of stock.

(b) That the "Manufacturer Members" each subscribe and pay in full for twenty-five shares of stock.

Transfers

"Dealer Memberships" can be sold or transferred only if all notes purchased or discounted (bearing "Dealer Member's" endorsement) have been paid in full, the purpose of this being that the value of the "Dealer Membership" shall be a guaranty as far as its value goes, to the Association for the payment of any liability which may accrue from the "Dealer Members" to the Association.

Operating Funds

It being desirable that the necessary operating funds of the Association be derived from other sources than its paid in capital, the following nominal charges shall be made to members using the service of the Association in discounting or selling notes:

(a) Two per cent. of the Consumer's purchase price on any truck sold on deferred payments (discounted by the Association) shall be paid into the Association by the "Dealer Member" who makes the sale, and requires the Association to discount the notes.

(b) Two per cent. of the Consumer's purchase price on any truck sold on deferred payments (discounted by the Association) shall be paid into the Association by the "Manufacturer Member" whose product is represented in such a sale.

(c) From these receipts shall be deducted:

(1) The Operating Expenses of the Association, including bad debts, advertising, legal expenses, etc.

(2) A sum equal to 7 per cent. for a reserve or surplus account.

(3) A sum equal to 7 per cent. for dividends on the paid in capital of the Association.

Refunds

The foregoing charges being met, the balance in the operating account is to be returned to the "Dealer Members" and to the "Manufacturer Members" (who paid it into the Association) pro rata, according to the amount paid in respectively.

Non-Salaried Officers

It is suggested that neither officers or directors, as such, be paid salaries, but that they be allowed traveling expenses and a per diem fee for attendance at the necessary meetings of directors and executive committees.

Security Against Bad Debts

The bad debts should be almost nil—because it has for security—

(a) The maker of the notes, whose credit must be found.

(b) The security of the "Dealer Member's" endorsement.

(c) The collateral security of a chattel mortgage on the trucks, the debts against which diminish monthly.

The discussion on this plan was postponed until a later session.

This paper was followed by one on the same subject by Mr. Gregg, who made the point that deferred payments increase the volume of sales, and if such a system were established, sales should be increased 200 per cent.

This system should not be left in the hands of the agent, but must be co-operatively managed by the dealer and manufacturer.

A paper on Territorial Lines for Dealers, by T. R. Lippard, of the Stewart Motor Corporation, of Buffalo, followed. Jos. C. Millman, of the Stegeman Motor Truck Company suggested in his paper, "Reforms Needed in Merchandising Motor Trucks," that a committee be appointed to investigate and report on truck-selling evils.

H. M. Alden's paper, "Evils of Overloading and Overrating for Trucks and Permissible Body Weights" was read in his absence by C. E. Redding. In this paper he called attention to the fact that overloading involves a study of human nature, and that no change in design or use of any preventive attachments will solve the difficulty. He believes in putting the blame squarely up to the user.

L. C. Freeman, of the Denby Motor Truck Company, then spoke on the same subject, followed by John Squires, of the Signal Motor Truck Company. He compared the load handling ability of the horse with the truck, and claimed the horse when heavily overloaded simply balked, while the truck could be thrown into a low gear, and be forced for long periods to do overwork before it would lay down. Because it can handle such loads it is made to do so. He claimed that speeding is not now such a factor as most truck makers use governors and in his experience he had found that governors were not as a rule tampered with. The use of the manufacturers' guarantee and caution plate were the suggested remedies.

J. G. Utz in his paper on overloading truck springs, pointed out the damage done by incorrectly-placed loads, long overhanging bodies, turning corners at too high speeds, lack of proper attention, loose clips, etc., and driving at too high speed with the truck empty.

F. A. Whitten's paper on the same subject closed the first session, which was very well attended.

In the evening the members were entertained at the banquet hall of the hotel by a Dutch lunch and vaudeville furnished by the Detroit Committee.

Thursday Sessions

On the second day the morning session was opened at 10 a.m. with Walter Wardrop presiding. M. L. Pulcher, of the Federal Motor Truck Company, Detroit, gave a talk on Lists, Discounts for Quantity Business, Discounts for Parts, Stock of Parts to Be Carried, and Percentage of Parts to Be Owned by Maker.

R. W. Hutchinson, Jr., who was to speak on Traffic Engineering, not being present, E. L. Schumacher, of the Denby Motor Truck Company, Detroit, talked. The fallacy of talking the technical points, omitting to show what the truck will do in the way of service, was indicated. He censured the truck salesman for his lack of definiteness and compared it with the accurateness with which the steam engine or producer gas plant man can predict performance costs. An educational campaign among drivers was urged. Salesmen must study prospect's business and suggest devices for loading, changes in buildings and platforms, but must be assisted by the traffic engineering department. In closing he emphasized that two things must be kept in mind; namely, every owner must be satisfied and the dealer must make a profit.

Captain Cardan, of the United States Navy, gave a most interesting paper on the opportunities of the American maker to supply all kinds of machinery to Europe. Our standardization, specializing and quantity production will enable us to meet European prices. He also spoke of the opportunity and advantages to be had by exhibiting at the Panama-Pacific International Exposition. Good men must be in charge as they will often be confronted by commissions from foreign governments. He painted in rose hues the opportunities for American transport equipment abroad.

Hugh McVey then talked on the field for trucks in farming communities, illustrating his remarks by diagrams, showing the distribution of cattle and food products in the United States. He stated that it costs as much to transport food to the shipping station as it does for freight by railroad to the market. The best part of our farming district is devoted to supporting the horse.

The Use of Trucks on Farms was the subject of a paper by D. F. Poyer, of the D. F. Poyer Company, Menominee, Mich. He cited the growing use of trucks by farmers and illustrated the reason by the following remark made to him by one of the users: "I can't afford to have my neighbor pass me on the road at 4 a.m. in his truck after having had 4 hours more sleep than I have and then get to market and be sold out before I get there and get the best prices and get home before I am sold out. It forces me to buy trucks or quit farming."

Some discussion followed, in which M. C. Horine pointed out some of the difficulties and mentioned the lack of care of machinery by farmers.

H. Horner said in defense of farmers, that they would take out machines from shed to put their automobile or truck under cover.

M. R. Machol spoke of hauling potatoes for a farming section by trucks. This allowed all horses to be used in digging, and as a result, 200 to 300 per cent. more potatoes will be grown in that section next year.

Instances of the development of thousands of acres of alfalfa land, caused by motor haulage, were cited by a California member.

Thursday Afternoon Session

S. V. Norton, of the B. F. Goodrich Company, read a most interesting paper on Tire Guarantee and Mileage, limiting his remarks to solid tires. He blamed the truck makers for overloading evils, claiming that undersized tire equipment was largely to blame. The weight of special bodies should be known by the manufacturer and suitable tire equipment put on the truck. Improper distribution of loads was also mentioned and its detrimental effects on tires pointed out. Overspeeding, cutting and skidding, as well as effects of overheating, were discussed.

The proper load rating for truck tires was ably presented by Roy Harris, of the Firestone Tire & Rubber Company, who showed that it is practically impossible to work out any definite standard owing to the large number of variables involved. His charts, showing the wide variation in sizes of tires as recommended by various makers, indicated lack of standardization. Evil of selling chassis and heavy body being fitted was again emphasized. He claimed tires should be according to the work of truck, just as much as body equipment. He suggested that a committee be appointed to investigate and report on abuses.

An illustrated paper, by J. E. Hale, of the Goodyear Tire & Rubber Company, on truck tire tests as to wear, proved most interesting. This is said to be the first test of its kind and was made on tires fitted to trailers. These were driven at various speeds and with different road and overload conditions, and by means of templets the tire wear measured. The tests are not yet completed.

The Manufacturers' Meeting

The regular session was then adjourned and the manufacturers, about thirty-five in number, held a private meeting to determine the advisability of forming an association. Mr. Walter E. Parker was elected temporary chairman. After much discussion and the views of all present were heard, a committee of five was appointed to report the next day. The committee was as follows: O. P. Briggs, Wilcox Company, chairman; John Squires, Signal Motor Truck Company; M. R. Machol, American La France Fire Engine Company; D. F. Poyer, Menominee Company, Mich., and John W. Van Allen, of the Atterbury Company. The meeting then adjourned.

Friday Sessions

In the morning session, David Beecroft in the chair; J. H. Thompson, of the Thompson Auto Company, Detroit, spoke on the subject of Manufacturers' Guarantee and Service to Owners from the dealer's viewpoint. W. L. Day, of the General Motors Truck Company, who was to speak on this subject from the manufacturer's viewpoint, was not present.

Group of a Few of the Members

Features of Mr. Thompson's paper are as follows: Charges for replacing defective parts should not be borne either by the dealer or user, but by the manufacturer. Makers should submit a schedule of such costs and guarantee for 90 days only. Dealers want a guarantee that can be lived up to. They also want allowances on defective parts replaced.

On Service and Free Service he said that free inspection is about all that is really needed. Copy of the inspector's report should be sent, not to the driver, but direct to the owner. He advocated the dealers getting together and taking some action on manufacturer's guarantee.

Discussion

The discussion was opened by W. C. Cronkright, of the Dequesne Motor Car Company, of Pittsburgh, Pa. His remarks centered around the thought that the dealer should not be required to carry a complete and extensive list of repair parts, but that the manufacturer should so systematize his replacement department that a man would always be on the job, ready on the receipt of a telegram, to ship the part at once.

Mr. Conant, of Gould Storage Battery Company, in discussing the subject, said: "The essence of true service is promptness," and elaborated on this subject.

B. A. Gramm, of the Gramm-Bernstein Company, expressed the opinion that every day the truck interests were getting further apart rather than drawing together. He made a plea for the handling of the truck business on the same basis as is done in handling machinery. He blamed the free service evil on the branch house. Claims if dealers get the list price they can give all the service required. He also scored manufacturers who put one-ton or two-ton parts into trucks and then rate them as two- or four-ton trucks. He closed with a suggestion that tire makers should not sell to a maker until sure tires suited to body and equipment to be used.

Mr. Geiser, of the Denby Motor Truck Company, in speaking of service, said, the salesmen, when selling a truck, promised the shirt off his back, but after the sale, took it off the customer's back. He believes manufacturers should agree on a uniform guarantee and accept no orders unless on dealer's paper and the guarantee signed.

Mr. Mansfield, of the Willys-Overland Company, spoke of special bodies as a big evil; believes dealers should carry parts and have them as standard as possible.

Mr. E. S. Foljambe, of *The Commercial Car Journal*, called attention to the fact that there would be less service required if manufacturers made all assemblies, such as the power plant, jack shaft, rear axle, etc., quickly removable units. A user could carry in stock, not an extra truck, but a few units which could be quickly installed while the others are repaired by competent workmen at a suitable time.

Charles E. Stone, manager of the Motor Truck Club stated that in his experience he found owners willing to pay for the time and labor required for putting in a part, but demanded that the dealer or the branch have the required parts on hand.

J. E. Ayers, of the General Motors Truck Company, of Detroit, told of the system employed by his firm, by which each owner gets a letter every month in regard to his equipment, with suggestions for ways of improving same.

The suggestion was made by Mr. Henretta, of Roanoke, that it might be a good thing if each of the manufacturers would have an expert cover definite territory to investigate personally why certain users were having trouble. Thus it was pointed out later, is exactly what is done by many of the large branches and agents.

J. C. Hillman, of the Stegeman Motor Truck Company, voiced his opinion that the guarantee ought not to be O. K.'d by any manufacturer until he was thoroughly familiar with the type of service in which the truck would be placed.

W. E. Parker, of the Thomas Motor Car Company, suggested that the dealer might have a plan by which his service is only for such owners as bring their trucks to him, or confer with him about them. He also suggested a system of premiums to the drivers by either the dealer or manufacturer, or both, these to go to the men with the best upkeep records on their vehicles.

At this point H. M. Allison, of the Packard Motor Car Company, of Chicago, also of the Chicago Automobile Association read a paper on used car central market reports, as established by him in Chicago. He asked why should any dealer buy a second-hand car without first looking up the market report on the price of such vehicle, any more than he would buy stock on the market without looking up a report. He outlined the methods employed, stating that the dealers send in the actual prices allowed on second-hand cars, but in a sealed envelope, the contents of which is, therefore, secret. These are opened and dumped out in the presence of a committee. In the corner of each envelop in which they are enclosed is a reference number to allow the secretary to check up from the envelopes which companies have answered and which have not. Since this system has been instituted dealers have responded, and a mass of information is obtained which is now made up in the form of the Used Car Central Market Report. This system is in use for pleasure cars, but can be applied to trucks when the second-hand market becomes sufficiently large a problem to warrant it. In his opinion he did not think that the time was ripe yet for this work.

Discussion was then called on the tire papers of S. V. Norton, Roy Harris and J. E. Hill of the afternoon session Thursday. The discussion brought up the subjects of the part the springs play in regard to tire life, but no definite information on this subject was to be had. Also the part that the driver plays. It was stated that if the dealer and the manufacturer cannot stop the driver from driving the car in the street-car tracks, how can the owner prevent it. Mr. R. Harris, of the Firestone Company suggested street improvements as in his opinion the only practical remedy.

Business Sessions Manufacturers' Committee Reports in Favor of an Organization

At this stage unfortunately many of the truck manufacturers, there being about sixty-eight present at the convention, had left the room. The Manufacturers' Committee reported in favor of an organization as a section of the Motor Truck Club of America. The discussion brought out a very strong feeling that they could not

of the Get-Together Convention, at Detroit

have sufficient independence and hold entirely separate meetings of their own within the Motor Truck Club. Although several spoke on the subject, still it was not made as clear as it might, that it was perfectly possible for the manufacturers to be entirely independent, yet have the advantage of the co-operation of the large membership of dealers and owners when such co-operation was desired. A vote was taken in which all were asked to participate. This resulted in the recommendations of the Manufacturers' Committee being adopted by a very small majority. A standing committee of three was then appointed to further consider the matter and report. This committee now increased to five consists of the following members: D. F. Poyer, of the D. F. Poyer Company, Menominee, Mich., chairman; M. L. Pulcher, Federal Motor Truck Company; Geo. Rees, John Van Alen and B. A. Gramm, of the Gramm-Bernstein Company; John Squires was made secretary, but not a member of the committee. The meeting adjourned.

Animated Discussion in the Lobby

Owing apparently to a misunderstanding of many of the prominent makers as to the character and scope of the Motor Truck Club of America, an animated discussion arose in the lobby, and continued for nearly 2 hours, in fact very few were in their seats when the afternoon session was called at 3 o'clock. However, they gradually drifted in until a fairly representative number were present.

Demonstration Not Necessary

The paper of J. C. Ayers on "Demonstrations Necessity, and Charges" which was scheduled for the morning, was carried over, Mr. Ayers claimed that demonstrations were not a necessity, and gave the results of tests on selling with and without demonstrations which substantiated his claims. During an entire year demonstrations were made, and only five per cent. of those demonstrated to, purchased, while 95 per cent. had their hauling done for nothing. In the next test, charges were made for demonstrations covering a long period, when it was shown that 87 per cent. of those demonstrated to, bought. Then demonstrations were entirely eliminated, and it was found that the sales were just as large if not larger than ever. The rates when charges were made were as follows: per day $8 for 1500-lb. truck, $10 for one-ton, $12.50 for two-ton, $15 for three-ton, and $20 for five-ton; $25 for special lumber or dumping-body truck. If demonstrations were made over very bad roads or into the country $5 extra per day was added, and overtime was charged for at the rate of $1.25 per hour. He did not believe even if demonstrations were charged for in returning the demonstration charges if the trucks were purchased, claiming that value had been received for the money, goods had been carried, etc.

Calculating Costs

The subject of how to calculate costs was ably dealt with by the papers of R. W. Hutchinson, Jr., of the Sternberg Manufacturing Company, of Milwaukee, Wis. In these he states that transportation effiency engineering is a probe commencing at the door of the prospect's stable and ending not at the door of the shipping room, but at the door of the customer whom the prospect serves. He made a plea for a simple cost form and a standardized one, care being taken that it is not so complicated that the ordinary delivery boss cannot comprehend it. He advocated the "zone" system of selling which centralizes effort in a place where the conditions are entirely suited to the vehicle and equipment, and pointed out how even climatic conditions played a very important part in the selection of equipment.

At the close of this paper, Charles E. Stone called attention to the standardized cost forms now being prepared by the technical committee of the Motor Truck Club, and said that these would soon be submitted to the members.

E. S. Foljambe, of *The Commercial Car Journal*, was then asked to make a verbal extract of his paper on "The Field for Medium-Sized and Small Trucks," as this paper had been printed and distributed to the members present. He dealt with statistics as compiled by the Government before the introduction of the parcel post, and with results of traffic engineering studies of department stores and other large concerns in New York City and Philadelphia to show that the average load of what he termed transfer, that is, carrying a maximum load to its destination without intermediate unloadings, and this includes heavy hauling, is but 4500 lbs. In the same way the average load of parcel delivery, such as that of merchants, department stores, etc., was shown to be as low as 550 lbs. Even during rush periods the proportion of payload to non-paying load was pointed out as being 74.7 per cent. non-paying load. As this non-paying load includes the weight of the truck it must be moved over the entire route, and the conclusion is reached, that in the majority of delivery departments it "costs too much to deliver the vehicle." From these various analyses it was concluded that the remedy consisted in using in delivery work, smaller vehicles, making more frequent trips with more nearly capacity loads.

M. C. Horine, of the Commercial Vehicle, was unable to present his paper on "Methods of Calculating Costs," as it was founded on a series of tables which required the use of a lantern, which unfortunately could not be had at the time.

The Banquet

The Friday evening session consisted of a banquet at the Hotel Cadillac. The toastmaster of the evening was James Schermerhorn, who convulsed his hearers with sparkling wit, humor and episode, which bubbled forth as spontaneously as water from a spring. He introduced B. F. Reimold, of the General Motors Truck Company, who read an original and most humorous composition on "The Ajax Snake Drive Company" a take-off on everything and everybody in the truck business.

Captain Cardan, of the United States Navy, was then called upon as an additional speaker. He pointed out the field for American trucks abroad, and also called attention to the advantages to American manufacturers of being ably and well represented at the coming Panama-Pacific International Exposition at San Francisco.

He was followed by John Lee Mahin, president of the Mahin Company, Chicago, who gave a most excellent address on the subject of advertising, in the course of which he advocated strongly what he termed the "free coinage of labor" by which he meant the employment at $1.50 a day on the public roads of the United States by the government, of every able-bodied unemployed man.

Last Day of the Convention

Although a part of the membership left Friday night, a representative turnout was present for the Saturday morning session, which opened at 10 with a paper by G. A. Wood, of the Wood Hydraulic Hoist Company of Detroit, Mich., on mechanical hoists, and dumping bodies for motor trucks. This paper was illustrated by some hand-worked, one-plane models which illustrated very clearly the points brought out in Mr. Wood's paper. He pointed out the dangers of some of the side-dumping designs, which throw enormous loads upon the springs and frame at one side and even cited instances in which the loaded bodies had turned the trucks over. He suggested a type as a future solution, the body of which raised as a unit on a shear-like frame.

A. R. Pardington Speaks on Lincoln Highway

President Joy, of the Packard Motor Car Company, being unable to be present, A. R. Pardington, of the Lincoln Highway, talked of the work that is being done among the farmers in connection with this Highway. He spoke with enthusiasm of the reception which is being accorded this project in all parts of the country and showed how it had stimulated the good roads movement in all sections, not only adjacent to the Highway itself, but even in remote districts. He pointed out that every mile of improved highway in the average farming communities opens up the way for ten potential truck prospects, and suggested that the sales departments follow road improvement, and catalog the farmers who are thus put in touch with possible markets if commercial cars are used. He made a strong plea for every truck maker and dealer to become a contributor and suggested that under all advertisements, the words "contributor to the Lincoln Highway" be printed in small type on account of its moral affect on others. Attention was called to the organization of women who are planting trees and otherwise beauti- American Institute of Architects who are designing free of charge bridges, arches, etc., for the said trans-continental road.

Mr. Trego, engineer of the Lincoln Highway then spoke briefly of the enthusiasm which was displayed by rural communities on the line of the old Sante Fé trail, and how this historic route has been made over, so that it is now suitable for trucks.

President Duck, of the M. T. C. A., then read a most interesting series of letters of invitation from various representatives of the P. P. I. E., to hold the Motor Truck Club's next annual convention in San Francisco at the time of the Exposition. An invitation was also read from the mayor and the Chamber of Commerce of Buffalo, and an invitation was also given in behalf of Detroit.

I. M. Hill, of the P. P. I. E., urged the manufacturers to make exhibits of trucks at the Exposition and cited several instances of commissions representing Australia and Argentine having written to the information bureau to know what exhibits would be made, and what would be their character, etc. He also mentioned that there would be over three hundred conventions held during the Exposition, among them the largest road convention which has probably ever taken place.

T. D. Pratt, of the Central Stamping Company, of Newark, N. J., an owner's delegate to the Convention, gave a short talk pointing out the fallacy of many users of attempting to operate a large number of trucks outside of their mechanical department, and suggested as work for the dealers and manufacturers the education of the user to the point where he will appreciate that trucks are mechanical equipment, and come under the mechanical end of the business, and should be in charge of the master mechanic connected with the plant.

Next Convention Place Referred to Officers

By vote of those present, the place of holding the next convention of the Motor Truck Club of America was placed in the hands of a committee consisting of the officers of the Club. After a rising vote of thanks to the officers and the Detroit men who had so ably assisted in making this first Get-Together Convention of motor truck interests a success, the meeting adjourned "sine die."

Commercial Car Production Estimate for 1915

Four Years' Production of Commercial Cars Shows That Industry is Recovering From Recent Stagnation and is Forging Ahead

THE accompanying tables showing the production of gasoline and electric commercial cars for the years 1912, 1913, 1914 and 1915, show the effect which the stagnation in general business has had upon the commercial motor car industry. Nineteen hundred and twelve was a normal year and the total production of both gasoline and electric commercial cars was 40,586. Towards the close of 1912 a pronounced boom was in evidence in the commercial car field. The mercantile world generally accepted the commercial car as an economic success, and many new makers had taken up the manufacture during the preceding year or 6 months.

In our November, 1912 issue, we drew attention to this fact, and the estimate for the 1913 production at that time was almost 90,000 commercial cars. It was during 1913, however, that general trade began to decline and products were curtailed, and although the output of commercial cars for that year amounted to about 67,000 machines, it was considerably under the estimated product for the year. The past year has seen a considerable decrease in the output, owing to the slump in general business. Some makers have abandoned the manufacture altogether, and others have cut down their output with the result that the estimated output of 1914 is 50,288 cars, quite a considerable reduction from the preceding year.

Many of the makers have received orders from the European governments which are at war and also from other European governments and it is predicted that every available commercial motor car will be bought up by these governments during the coming winter. This together with increased export trade in other parts of the world and renewed prosperity at home assure the commercial car manufacturers of continued activity.

Therefore, the estimates for 1915 production, as shown by the tables, we regard as very conservative, and we believe that the total of 63,183 will, be greatly exceeded.

In 1912 the Ford Motor Company made 1850 commercial cars, that is, they supplied that number of their cars with commercial bodies on them. Since that time they have not supplied any commercial car bodies, but this has not stopped the use of the Ford chassis for commercial car purposes. Many thousands of Ford cars have been purchased by business houses, who have removed the pleasure car body and replaced it with a commercial car body of their own. It is possible that if the number of these cars which were converted for commercial purposes could be ascertained, the number of commercial cars for the years 1913 and 1914 would be increased by at least 5000 cars for the former year and 8000 or 10,000 cars for the past year. As the Ford Company has now announced that it will sell its chassis separate, it is safe to say that an increasing number of these will be purchased and used for commercial purposes.

In addition to this, there are a number of other pleasure cars continually being converted to commercial purposes. There is no doubt that the reason why so many Ford cars are converted is because there has been a dearth of commercial cars of this size available for delivery purposes.

The number of manufacturers of commercial motor cars decreased quite considerably during the years 1913 and 1914. Within the past few months, however, a number of new makers have entered the field, especially in the light delivery car field, and there is every indication that the commercial motor car industry will make steady progress in the years to come.

Manufacture of Commercial Cars Increasing as Rapidly as Did Pleasure Cars

In comparing the production of commercial cars with that of pleasure cars when the pleasure car industry was in its early years, it will be noted from the following table that the years 1912 to 1915 in the commercial car production show almost as much increase in production as do the years 1905 to 1908 in the pleasure car production, with the exception of the one year 1914 which was affected by the slump in general trade.

Pleasure Car and Commercial Car Production Compared

Pleasure Cars		*Commercial Cars*	
1905.....	38,000	1912.....	40,000
1906.....	70,000	1913.....	67,000
1907.....	90,000	1914.....	50,288
1908.....	110,000	1915.....	63,183

The percentages of increase are almost as great in the commercial car production as they were in the pleasure car production, with the exception of the one year, and we believe that in the coming years commercial cars will increase in as large percentages as has the pleasure car industry and it will require but a year or two for the commercial cars to exceed 100,000 a year, after which time the increase will be still more rapid.

Production of Gasoline Commercial Cars for Four Years

Carrying Capacity.	1912. Makers.	1912. Cars.	1913. Makers.	1913. Cars.	1914. Makers.	1914. Cars.	1915. Makers.	1915. Cars.
¼ Ton.....	20	4506	16	7492	22	330	31	1629
½ Ton.....	34	4592	31	10928	29	9444	32	13545
¾ Ton.....	39	4685	46	9568	39	6820	38	7975
1 Ton.....	66	5098	62	7770	72	8904	68	10458
1½ Ton.....	39	3115	46	7695	63	5536	59	6387
2 Ton.....	56	3168	57	5135	73	5039	71	6615
2½ Ton.....	5	425	4	60	9	210	11	375
3 Ton.....	58	4865	52	5675	52	3887	48	4884
3½ Ton.....	8	276	13	864	18	945	15	930
4 Ton.....	15	1072	15	1116	25	845	24	960
5 Ton.....	44	2212	43	2604	47	1581	44	1995
6 Ton & over	12	687	12	765	16	502	18	545
Total	256	34701	214	59672	210	44043	245	56288

Thirty-one Gasoline Commercial Car Makers did not report and their product is therefore not included in the above.

Production of Electric Commercial Cars for Four Years

Carrying Capacity.	1912. Makers.	1912. Cars.	1913. Makers.	1913. Cars.	1914. Makers.	1914. Cars.	1915. Makers.	1915. Cars.
¼ Ton.....	5	550	5	760	4	550	4	650
½ Ton.....	13	1720	13	2240	11	1600	11	1785
¾ Ton.....	2	125	2	200	2	70	2	80
1 Ton.....	9	1240	9	1480	10	1655	10	1815
1½ Ton.....	4	195	4	220	3	110	3	120
2 Ton.....	5	655	5	810	6	905	6	985
2½ Ton.....	2	225	3	300	3	125	3	135
3 Ton.....	4	160	3	180	..	.....	..	.....
3½ Ton.....	7	550	7	720	8	650	8	695
4 Ton.....	2	110	2	115	2	35	3	40
5 Ton.....	5	345	5	540	6	500	6	540
6 Ton & over	1	10	1	20	2	45	2	50
Total	29	5885	30	7585	23	6245	24	6895

Ten Electric Commercial Car Makers did not report and their product is therefore not included in 1914 and 1915.

MOTOR TRUCK ASSOCIATION OF PHILADELPHIA MONTHLY MEETING

OFFICERS and members of the Motor Truck Association were entertained at a banquet during the regular monthly meeting, which was held in the Green Room of the Hotel Adelphia on Wednesday evening, September 16th.

President E. B. Jackson called the meeting to order, and, after Secretary Metcalf had read the minutes, heard the various reports of the committees. Ross Walton, chairman of the Membership Committee, read the applications for six new members, and explained that a press membership had been created and that no doubt the automobile editors and advertising men connected with the various newspapers would be admitted to membership in the association. E. S. Hare reported for the Entertainment Committee that they were arranging to provide good speakers and entertainment for the meetings. E. M. Bartlett reported for the Publicity Committee that two meetings of this committee had been held, and that publicity was being furnished to the newspapers each week, and that the Philadelphia newspapers were co-operating with the association. G. A. Barden, chairman of the Traffic Committee, reported that his committee would have a meeting in a few days, and that there was a number of traffic problems that he proposed to take up. D. G. Zimmerman, chairman of the Legal Committee, reported that they were taking up the question of having the association incorporated in any legal matter that may come up, and he would appreciate it if the members of the association would notify him. L. L. Woodward, chairman of the Reception Committee, asked that the title of his committee be changed to the "Get Together" Committee. He reported that his committee was doing good work in making the members acquainted with each other and getting them out to the meetings. Each member of the Reception Committee wore a silk badge designating the name of their committee. J. D. Howdy, treasurer of the association, gave a brief statement of the finances of the association, which he reported in excellent shape.

President Jackson outlined the ideals of the association and reviewed the various phases of the motor truck industry. Mr. Jackson emphasized that hearty co-operation between the association and members was necessary to insure success for the association, that it was essential to educate the motor-truck owner and buyer in their delivery problems in order to obviate mistakes. Mr. Jackson's speech in part follows:

"I believe that every member realizes that this association is a necessity. This is a new industry and there are a great many things which come up from time to time, and it is essential that some one take care of them; things that have a lot to do with the success or failure of this industry, that is the reason we have organized the truck association.

"I think you will agree with me that we have the support of every man in the truck business. It is a business proposition all the way through. You all know that the truck is here to stay. You all know that there are hundreds of men in the city to-day who could profit by having your trucks. You all know that there are hundreds of houses in Philadelphia that don't know what you know, if they did your business would be doubled, tripled, quadrupled. We have made mistakes in the past, we have sold electric trucks where we should have sold gasoline trucks, and we have sold gasoline trucks where the electric would have done the work better. We have sold small trucks where we should have sold large ones, and in some instances we have sold large ones where we should have convinced the customer that he needed a small one. These things always come back. You have gotten the cold shoulder from the man who has had such experience.

"The idea of this association is to have us all work in harmony and work together. You all have customers who operate their vehicles at no expense, and you have others who have no more right to own trucks than I have to put a piece of ice on Broad Street in July, and think it won't melt. These things hurt business. Another thing that hurts business is the fact that some people buy trucks who have not the slightest idea what it actually costs to handle their goods."

President Jackson was followed by E. J. Cattell, city statistician.

Extracts from address delivered by Mr. E. J. Cattell, city statistician:

"Gentlemen: You stand for a force and principle that will help the whole world. You stand as one of a force helping to make this country more than any other force I know of. And I tell you this, that after having spent years studying our financial conditions, you and your motor trucks are making history. You are making this republic stronger. I speak to you from my heart when I say that I regard your organization as one standing for a mighty force. You are working, as only men will, to procure a great future for your organization.

"Only a short time ago I was visiting on a farm, within 16 miles of Philadelphia, where hundreds of bushels of tomatoes were rotting on the vines because the cost of transporting them into Philadelphia was prohibitive. There is one opening for your motor trucks. If one farmer in that vicinity had one of your trucks he could have hauled not only his own produce but the produce of the other farmers into the city and they could have been sold at a profit to the farmer. In this way I see where your motor trucks will and are bound to reduce the high cost of living. You men are doing something, you are not just talking. * * *

"A short time ago I talked to a thousand boys from Ohio in the City Hall courtyard. The expense of these boys coming on East, to see the many historical features that abound in Philadelphia, because these boys were the most successful in increasing the bushels per acre of corn. One boy had increased the bushel per acre from 39 to 80 bushels, and the most successful boy from 39 to 390 bushels. When the boys have had their fathers to do as they have done, we will derive from corn alone more wealth than the total actually of all the railroads in the United States. We cannot realize what there is ahead of us in real wealth.

"While spending some time in a place within fifteen miles of this city, I saw potatoes actually rotting, while we were buying them in Philadelphia that had been brought from places hundreds, yes, thousands of miles away, while the farmers right at our door could not make it pay them to ship his potatoes into the city by freight or drive them in by wagon. This is another instance where your trucks will work in, and will help solve this high cost of living. * * *

"How much happier we would all be if we played the square with ourselves and with our associates. Speaking of games, that National game of baseball is the greatest game in the world. It's played square, it has to be, and we must learn, as the ball players have to learn, to be governed by the decision of the umpire, and when we dispute the decision of the umpire we are seeking trouble which could be avoided.

"Gentlemen, I predict that in 18 months we will enter into the greatest era of prosperity ever enjoyed by any country. Let us be prepared now for that prosperity which is coming. Be ready to grasp opportunities to increase our business, to enrich ourselves and enjoy the grand commonwealth in which we live.

Next meeting of the association will be held Wednesday, October 21st.

HESS-BRIGHT TO MANUFACTURE IN THIS COUNTRY

To the Editor:

When, on the first of August, communication with our Berlin factory was interrupted, we had approximately one-half million bearings in stock. With the exception of a few sizes in which a shortage was caused by an unusually heavy demand, our stock was well balanced and large enough to supply the demands of our regular customers for several months.

Upon learning that we could not depend upon our usual source of supply, we took steps to provide bearings in those sizes where shortages occurred. As our manufacturing facilities were inadequate we deemed it advisable to have a portion of the work done by outside parties rather than seriously delay and inconvenience our customers, to whom we feel morally obligated even though we have been much handicapped by conditions over which we have no control.

Rings in various stages of completion (which will be finished in our own factory) and in some cases complete bearings, particularly thrusts, are being made for us. In all cases this work is being done in accordance with our specifications and must pass the same rigid inspection to which all our imported bearings are subjected. All bearings sold by us are subject to our usual guarantee covering defects of workmanship or material developed within one year.

Our own manufacturing facilities are being increased as rapidly as is consistent with the production of first quality bearings. Our experience as ball bearing manufacturers covers a period of over nine years, and thousands of bearings made in our factory are giving most satisfactory service.

Although bearings are now being shipped to us from Berlin, we are proceeding on the entirely independent basis of manufacturing here.

Many of our customers have expressed their approval of our decision to manufacture in this country and have in other ways shown a spirit of co-operation and loyalty in the present rather trying situation, which is most gratifying and highly appreciated.

THE HESS-BRIGHT MANUFACTURING COMPANY,
B. D. GRAY,
Vice-President and Manager.

Factory News and Changes

Walker-Weiss Axle Company, Flint, Mich., is to erect an addition to its plant at the cost of $20,000.

United States Truck Company, of Covington, Ky., is to add to its product a one-ton truck and a one and a half ton truck.

Bull Tractor Company, of Minneapolis, Minn., is placing a three-wheel tractor on the market which is designed to replace horses in farm work.

Lippard-Stewart Motor Car Company, formerly located at 1738 Elmwood Avenue, Buffalo, N. Y., is now in its new factory at 226 West Utica Street.

Willard Storage Battery Company, Cleveland, Ohio, is to soon begin the construction of a new plant at the cost of $35,000. The building will be 200x135 ft.

Royal Motor Truck Company, New York City. Joseph Seeman, Howard L. Sills and Oscar H. Montgomery have sold their interest in the company to John A. Pietsch. The business will be continued under the same title with John A. Pietsch as president and with a new board of directors.

MotoKart Company, New York City, has been succeeded by the MotoKart Company, Inc., which has been incorporated for the purpose of taking over the plant, machinery, patents, equipment, materials, accounts, etc., of the old concern. The capitalization of the new concern is $1,000.000.

Henderson Brothers, North Cambridge, Mass., have closed with the O. K. Motor Truck Company, of Flint, for all New England and eastern Canadian territory, and will assemble the trucks at their factory, taking twenty-five workmen from the factory of the O. K. Motor Truck Company, at Flint, Mich.

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WAR STIMULATES TRUCK INDUSTRY OF UNITED STATES

TRUCK makers of this country have been electrified into instant action by a call from the warring nations for a large number of motor-driven trucks and trailers for army purposes. At the beginning of hostilities the possibilities of this country receiving large orders for motor trucks was at once recognized by our makers, but the majority believed that the government would prevent shipments on grounds of these vehicles being contraband of war. A well-known firm in Pennsylvania, however, succeeded in getting rulings on this subject, and it was found that if the owners assumed the risks, the shipments could be made. The company in question received and filled orders for various types of armoured wagons, vehicles with searchlights which could be pushed by hand on small wire wheels to a considerable distance from the armoured truck, carrying the power plant and generating apparatus for the light. By this arrangement the truck could be hid by the roadside or among the trees at some distance from the searchlight, and thus escape observation and the enemy's fire.

Trucks for many and varied war purposes are now being built for the belligerent nations. The industry as a whole has received tremendous stimulus from the first order of approximately two thousand motor-driven trucks, and some three hundred combination tractors and trailers, placed direct by the French Government through its representative Ambassador Jusserand, and two French army officers from the front.

France is not the only country that is in the market for trucks. England and Russia are large buyers, and Greece is also purchasing. These countries are not only buying trucks, but all kinds of munitions of war.

An immense number of horses are also required, which will greatly deplete the market, increase the price, and indirectly increase our home consumption of commercial cars.

It is very evident that American truck makers will be hard pressed to supply the immediate demands for trucks. This means an increase of business at a most opportune time, and should result in improved conditions in the industry.

Not only the truck makers, but also all the solid tire manufacturers are being pushed to the limit to supply the immediate demand. Some of the truck makers were asked for many more cars than they could possibly give without disappointing their immediate home trade, others have completely sold their output that could be cared for within the time limits specified by the Foreign Powers, and will be ready to begin a new slate in the near future.

These results have been brought about by the immediate demand. It is safe to predict that if this war continues for a few months, that at its close there will be fully as great a demand for motor-driven vehicles by individual companies in the war-devastated zones. Business must be resumed, and during this reconstruction period what is more natural than a demand on the part of the business man for motor-driven delivery vehicles such as they have been using for the past ten years.

The United States stands alone as the great producer and although England's production is only slightly curtailed, that of Germany and France is almost entirely cut off. The United States is the only source from which they can hope to obtain commercial cars in large quantities. Manufacturers of parts and accessories and complete cars should be prepared for this reconstruction period. Now is the time to prepare.

REPRESENTATIVES OF FOREIGN POWERS NOW BUYING AMERICAN TRUCKS

For Great Britain:—

H. G. BURFORD, M.I., Mech.E., M.I.A.E., Mgr. Director Automobile Consolidated Alliance, Ltd., 1 Albemarle St., London, W.

American Address: Chipman, Limited, 8-10 Bridge St., New York.

COLONEL HUGHES, Commander of the Dept. of Militia and Defense, Ottawa, Canada.

For Russia:—

COLONEL NICOLI GOLIJOSRKI, Vanderbilt Hotel, New York.

For France:—

AMBASSADOR JUSSERAND, and CHARLES R. FLINT & CO., New York.

PARTIAL LIST OF TRUCKS SOLD TO EUROPE

To Gt. Britain,	1000 Autocars	To France -	338 Packards
To Russia -	180 Packards	" " -	200 Pierces
" " -	45 Garfords	" " -	150 Jefferys
To France -	750 Whites	" " -	150 Reos
" " -	340 Kellys	To Greece -	50 KisselKars

LETTERS FROM TRUCK MANUFACTURERS REGARDING THE OUTLOOOK FOR THE COMING YEAR

The communications, and extracts thereof, printed herewith, are in answer to our letter to truck makers regarding their opinions as to the outlook for the coming year. Quite a number of letters received have not been published, due to lack of space, most of which, however, bespeak an optimistic feeling on the part of the makers.

The Gramm-Bernstein Company is convinced that the motor-truck industry will have not only prosperity, but will be taxed to its limit. It states as follows:

"It was very hard to figure out exactly what the outcome would be until the European War situation changed the complexion of the entire affair. Even a full swing of prosperity in this country, while it would, of course, place every truck factory active, would not bring about the great rush of business under about a year or year and a half's time, but the present war situation has burst upon us so suddenly that the enormous demand that is now coming to all reputable truck manufacturers by representatives of foreign governments who are purchasing in lots as high as a thousand, means that every reputable manufacturer who has a first-class product and is in position to turn out his trucks will be pushed to his utmost. The capacity of every manufacturing institution will have to go its limit.

"There is only one thing that will hold back enormous production, and that is the fact that most parts makers and raw material houses have been carrying a very low stock on account of the depression in business the past year and the money situation is, of course, another phase that has effected the situation, but we feel even the latter will be swept aside in the near future, for the immense sums of money now held for war purposes by the foreign governments will all be brought to this country in exchange for materials that they will have to have. We are now convinced that the motor truck industry will have not only prosperity, but will be taxed to its limit."

The Reo Motor Truck Company says it is not worrying over the foreign market as there are too many good prospects in this country to let the export situation disturb it. This company is very optimistic, as may be gleaned from the following:

"We believe that an era of wonderful prosperity is here. It is only necessary to rub the war smoke from one's eyes to see it. Some few manufacturers in this country have been held up by their inability to export, but, on the other hand, the opportunities that have been opened to manufacturers in this country to produce those commodities which have heretofore been imported will many times extend the losses entailed by loss of export business.

"The ability of this country to consume most of this wonderful produce puts us in an enviable position, for, after the war has progressed a few weeks, business will adjust itself, and if we do not export a dollar's worth of material, we will still be a prosperous nation and will have advanced fifty years ahead of Europe. Yes, if the war continues for a couple of years the United States will be a century in the lead.

"So far as our own business is concerned, we can't help but feel optimistic. Our dealers are ordering in larger quantities than ever before. The increase in orders for trucks may be due to the fact that many dealers, who have been handling pleasure cars only, have watched the success of other dealers selling pleasure cars and trucks and now realize that one line fills a gap in the other. Many reasons may be given for our unusual success at this writing, but we are inclined to give the general prosperous and optimistic attitude of manufacturers, farmers and other business men toward the future, full credit for our own prosperity.

"Just recently we figured that Reo trucks were being used in over 150 different lines of business. This discovery brought to my mind the poster the *Commercial Car Journal* showed some time ago of a truck pushing a horse over a precipice into oblivion. While the poster was a caricature, it contained, as our discovery shows, a world of truth.

"There is no limit to the business uses of motor trucks, and war or no war, merchants are forced to economize in order to compete, and one of the greatest economies is changing from horse-drawn equipment to motor-driven delivery.

"We are not worrying over the foreign market—there are too many good prospects in this country to let the export situation disturb us.

"Take the truck farm for example. If all the truck farmers would suddenly see the light of day and realize they could save thousands of dollars through the use of motor trucks over the horse-drawn method, there would not be enough manufacturers of motor trucks in the United States to supply their demand in several years' time.

If we of this prosperous and happy country continue to believe in it and in ourselves, no condition in a foreign nation or group of nations could impose, except the declaration of war, that should disturb business, our peace of mind or our happiness."

The Stewart Motor Corporation writes as follows:

"In our opinion the outlook for the coming year is better than ever; first, because more delivery trucks are now in use than ever before, and second, many of the largest corporations who have been experimenting for the past three or four years are now repeating heavily.

"Then, too, the war in Europe has destroyed a great many trucks in addition to thousands of horses. After the war, horses will be higher in price and fewer than ever, because if the war continues the world will be combed for horses.

"The increase in the number of commercial vehicles in use each year over the previous year we think is the best reason for increased business next year. Motor trucks have been more nearly perfected than ever before, and we believe that sufficient pioneering has now been done to start a demand; in other words, the past, up to this point, has been a period of education."

The American Electric Car Company, maker of the Argo Electric Commercial Car, thinks that the manufacturer should plan future business only upon conservative lines:

"We must confess that prophesying for next year would have to deal with so many contingencies that about the only safe plan for any manufacturer to pursue is to produce along very conservative lines. In fact, we believe that the spirit of conservatism and caution is so widespread at the present time that any other policy by a commercial car manufacturing concern would subject the management to very considerable criticism.

"We hear a great deal of enthusiastic talk as to the immediate South American markets open for the American manufacturer, and if business conditions in South America were normal at the present time, the opportunity for laying the foundation for a profitable future business would no doubt, exist, but until such time as the financing of our neighbors of the South is either undertaken by the bankers of this country or resumed by the bankers of Europe, South America is not going to be a very favorable market for commercial cars. Apparently, some of the gasoline truck manufacturers are in receipt of some orders from abroad for military use, and in England particularly, with the settlement of the war, there will be, undoubtedly, a call for electric trucks for city use in such character of business to which electric cars are particularly adapted. Where new equipment will be purchased on account of the equipment heretofore in use having been taken over for military purposes. It goes without saying that we are all going to do considerable domestic business, but unless conditions change materially, it will be of smaller volume than we have had this past season."

Pope Manufacturing Company, of Hartford, Conn., has been authorized by Judge Joseph Tuttle, of the Superior Court, to pay a dividend of 10 per cent. on the claims allowed. Colonel George Pope, receiver, represents that he has sufficient funds to pay a 10 per cent. dividend on disallowed claims if they are eventually allowed. The allowed claims amount to about $1,600,000.

Mayor Mitchell, of New York City, has vetoed the ordinance repealing the ordinance requiring the use of oil separators in all garages; and now automobile interests will endeavor to have the ordinance passed by a two-thirds vote in the Board of Aldermen over the Mayor's veto. The principal objection of the automobile interests to the installation of oil separators is that none of these devices now on the market will actually separate oils in every day use.

A motor truck ambulance has been purchased by miners employed by a Castleford, Yorkshire, England, colliery, to be used exclusively for their benefit. The company employing them offered to pay a part of the purchase price, but this was refused by the miners, so that no question could arise as to their jurisdiction and control of the ambulance. This is the first instance of employees of a concern buying an ambulance and maintaining it themselves.

EXPORTS AND IMPORTS OF AUTOMOBILES FOR AUGUST

Exports of automobiles for August show a marked decrease from those of August of the previous year. Imports have also fallen off for all countries with the exception of Italy. The following table shows the imports by countries:

Countries from Which Imported.		August—				Eight Months Ending August—					
		1913		1914		1912		1913		1914	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
France	No..	10	22,208	5	3,008	285	699,881	130	298,910	51	91,717
Germany	No..	3	3,213	1	1,428	39	92,854	75	194,487	10	16,556
Italy	No..	4	8,123	8	9,086	51	85,864	54	110,327	26	31,884
United Kingdom	No..	4	9,144	2	2,517	101	240,870	31	92,493	15	31,496
Other countries	No..	10	18,511	4	3,770	57	118,059	61	133,503	22	26,787
Total	No..	31	61,199	20	19,809	533	1,237,528	351	829,720	124	198,440

Countries to Which Exported.		August—				Eight Months Ending August—					
		1913		1914		1912		1913		1914	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
France	No..	40	39,453	...	...	481	368,955	607	468,586	1,044	625,636
Germany	No..	70	55,577	...	...	310	244,747	831	734,039	1,063	799,552
Italy	No..	30	19,153	1	1,000	208	191,132	252	217,453	229	148,388
United Kingdom	No..	461	374,098	27	38,500	3,789	2,840,038	3,431	2,624,138	4,904	4,126,263
Other Europe	No..	91	68,308	12	10,533	1,164	971,038	1,389	1,196,415	2,378	1,886,647
Canada	No..	274	416,181	238	377,821	5,517	6,740,174	5,007	6,705,222	3,594	4,447,442
Mexico	No..	18	32,923	6	4,400	150	218,309	160	288,210	60	70,374
West Indies and Bermuda	No..	36	34,325	32	19,247	215	230,948	322	321,163	352	305,310
South America	No..	231	285,835	19	13,288	1,245	1,461,459	1,963	2,249,163	891	722,527
British Oceania	No..	284	228,389	79	60,562	2,354	2,161,049	2,157	2,056,079	2,666	2,294,033
Asia and other Oceania	No..	186	192,748	14	19,404	955	987,575	1,631	1,602,835	1,193	1,120,405
Other countries	No..	283	236,759	23	21,140	428	398,347	1,444	1,281,179	929	828,740
Total	No..	2,004	1,983,749	451	565,895	16,816	16,813,771	19,194	19,744,482	10,303	17,384,317

Conventions of Interest to the Trade

National Conventions

October 19-24—at New York City. National Varnish Manufacturers' Association. G. B. Heckel, 636 the Bourse, Philadelphia, is Secretary.

October 28-30—at Chicago, Ill. National Association of Ice Cream Manufacturers. Address Association of Commerce.

December 14-17—at Chicago, Ill. American Road Builders' Association. E. L. Powers, 150 Nassau Street, New York City, Secretary.

State Conventions and Fairs

October 22-31—at Chicago, Ill. National Dairy Show.

October 26-November 14—at Portland, Ore. Manufacturers' and Land Products' Show. A. P. Bateham, Chairman of the committee in charge.

October 27-30—at Charlotte, N. C. Charlotte Fair Association. Edgar B. Moore, Secretary.

October 27-30—at Thomson, Ga. McDuffie County Fair Association. Ira E. Farmer, President.

October 27-31—at Clanton, Ala. Chilton County Fair Association. J. N. Dennis, Secretary.

November 2-7—at Lexington, Miss. Mississippi Valley Fair Association Annual Fair. W. I. Picoms, Secretary.

November 2-7—at Troy, Ala. Pike County Fair. M. C. Folmar, Secretary.

November 2-7—at Orange, Tex. Orange County Fair Association. Secretary L'Hommedieu is preparing for the event.

November 3-6—at Spartansburg, S. C. Spartansburg County Fair Association. Paul V. Moore, Secretary.

November 4-11—Louisiana State Fair.

The list of conventions given herewith is published each month, so that commercial car manufacturers can communicate with the proper authorities, with the idea of arranging to give lectures, illustrated talks, statistics, etc., to show the advantage of motor trucks in these various lines; also, possibly, to show and demonstrate their cars.

November 4-14—at Mobile, Ala. The Gulf Coast Fair. Mort L. Bixler, Secretary.

November 6-14—at Los Angeles, Cal. State Fruit Growers' Association. Harry F. Stahler, of Yuba City, is President.

November 7-13—at Macon, Ga. Georgia State Fair. Harry C. Roberts is Secretary and General Manager.

November 8—at Atlanta, Ga. Fourth American Road Congress. Convention Bureau may be addressed.

November 16-21—at Columbus, Ga. Fair and Poultry Show Association. John S. Jenkins, Secretary.

November 19-26—at Beaumont, Tex. Southeast Texas Fair. F. M. Law, President of Association.

December 1-4—at Des Moines, Ia. Convention of Iowa Retail Implement and Vehicle Dealers' Association. Commercial Club is interested.

December 7-14—at Phœnix, Ariz. American Mining Congress will convene. James F. Callbreath, 711 Cooper Bldg., Denver, Colo., is interested.

December 8-10—at Oklahoma City, Okla. Hardware and Implement Association Annual Convention. W. B. Porch, of Mustang, Secretary.

December 8-11—at Bangor, Me. Maine Dairymen's Association. Leon S. Menial, of Orono, is Secretary.

January 12-15—at Chicago. Illinois Retail Hardware Association. L. D. Nish, of Elgin, Ill., is Secretary.

January 26-29—at Indianapolis, Ind. Retail Hardware Association. M. I. Corey, of Argos, Secretary.

January 26-28—at Waco, Tex. Retail Hardware Association Convention. Henry Marti, of Dallas, Secretary.

February 16-19—at Cincinnati, Ohio. Retail Hardware Dealers' Association State Convention. Headquarters at new Gibson Hotel. Exhibit at Music Hall. James B. Carson, of Dayton, Secretary.

February 17-19—at Fargo, N. D. Annual Convention of North Dakota Hardware Association. N. C. Barnes, of Grand Forks, is Secretary.

February 19-22—at St. Louis, Mo. Retail Hardware Association and Mississippi Valley Implement and Vehicle Association Annual Convention. F. X. Becherer, Secretary, 5136 North Broadway.

February 23-25—at Lexington, Ky. Retail Hardware and Stove Dealers' Association to convene. Headquarters are at Phœnix Hotel. J. M. Stone, of Sturgis, Ky., Secretary.

Firemen's Conventions

October 20-23—at New Orleans, La. International Fire Chief's Association to convene. Chief Louis Pujol preparing for event.

December 1-3—at Chicago. Annual Convention National Firemen's Association. National Hotel headquarters. Ex-Battalion Chief Bert Fisher, of Chicago, Secretary.

Steel and Rubber Markets

Steel Declines Slightly

Since our last writing the prices of steel products have again been lowered. Mills are running about 40 per cent. capacity. Some additional sales of wire products have been made for export to Great Britain, and quite a large tonnage of steel billets is under negotiation for such shipments.

The government returns of iron and steel imports and exports in August are surprising. In exports the decrease from July was less than 25 per cent., while imports showed an increase of 14 per cent. over July, and with the exception of April were the largest of the year.

The August tonnage exported was 86,599 gross tons, a decrease of 24.6 per cent. from the 114,790 tons shown for July. The average exports in the first 6 months of the year were 141,000 tons a month.

Quotations on October 9th were:

STEEL PRODUCTS PRICES

Bessemer steel, per ton, mill	19 50 a 20 00
Open hearth, per ton, mill	20 00 a .....
Sheet bars, per ton	20 50 a 21 00
Steel bars, soft base, half ex. tidewater	1 26 a 1 36

The above prices are at tidewater in carloads and larger lots. For quantities less than 2000 lbs., but not under 1000 lbs., $2 per ton additional is charged, and less than 1000 lbs., $8 per ton additional.

SHEETS

The following prices are for 100-bundle lots and over f. o. b. mill; smaller lots $2 per ton higher.

Gauge—	Black.	Galvanized.	Gauge—	Black.	Galvanized.
Nos. 22 & 24	1 85	2 55	No. 28	2 00	3 00
Nos. 25 & 26	1 90	2 65	No. 29	2 05	3 15
No. 27	1 95	2 85	No. 30	2 10	3 30

IRON AND STEEL AT PITTSBURGH

Bessemer iron	14 90 a .....
Bessemer steel, f. o. b. Pittsburgh	20 00 a .....
Muck bars	28 00 a .....
Skelp, grooved steel	..... a 1 15
Skelp, grooved iron	1 50 a .....
Ferro-manganese (80 per cent.), seaboard	68 00 a .....
Steel, melting scrap	11 25 a 11 75
Steel bars	1 10 a 1 15
Black sheets, 28-gauge	..... a 2 00
Galvanized sheets, 28 gauge	2 95 a 3 00
Blue annealed, 10-gauge	1 40 a .....
Tank plates, ¾ and heavier	1 10 a 1 15

Crude Rubber Drops Again

Rubber prices have again fallen off somewhat, up-river fine being quoted at 64a 65 as against 73 and 74 the same time last month. Only jobbing quantities are in demand. Quotation on October 9th were:

Up-River—	
Fine	64 a 65
Coarse	44 a 45
Island—	
Fine	49 a 50
Coarse	27 a 28
Cameta	28 a 29
Caucho Ball—	
Upper	44 a 45
Lower	42 a 43
Centrals—	
Corinto	40 a ..
Esmeralda	39 a ..
Guatemala, slabs	35 a 37
Mexican—	
Scrap	39 a ..
Strips and scrap	38 a 40
Guayule	.. a ..
Balata, sh't	55 a ..
Ciudad, b'k	.. a ..
Trinidad, b'k	Nominal
Africans—	
Massai, red	.. a ..
Red, C'go	Nominal
B'k, C'go	.. a ..
Soudan—	
Niggers	Nominal
Gambia, prime	.. a ..
East India—	
Smk, sh'ts	60 a 65
Ceylon, bis & sheets	58 a 59
Pale crepe	58 a 60
Pontianac—	
P'me plantation	6 a ..
Palembang	6 a ..

DOMESTIC SCRAP RUBBER

Boots and shoes	7 a 7⅛
Tires—Automobile	5 a ...
Bicycle, pneumatic	3 a 3¼
Wagon and carriage, solid	5½ a ...

Goodyear Tire & Rubber Company, of Akron, Ohio, has declared its usual quarterly dividend of 1¾ per cent. on the preferred stock of the company, payable October 1st.

Firestone Tire & Rubber Company, of Akron, Ohio., has declared a quarterly dividend of 3 per cent. and an extra dividend of 2 per cent. on its common stock and the regular quarterly dividend of 1¾ per cent. on its preferred stock.

The metropolitan abattoirs in Adelaide, South Australia, slaughter practically all the animals used for food in that city and the surrounding district. The plant is controlled by a board which has established a garage and maintains twenty seven-ton trucks used in the distribution of meat to the different points. A foreman is in charge, who sees that the trucks are kept in good condition. Previous to using trucks in the distribution of meat, animal conveyance and railroads were used, which were much more expensive and less satisfactory as far as time was concerned.

In Los Angeles, Cal., there are 2800 motor trucks in daily use. These vehicles are valued at $25,000,000.

Tiffin Wagon Company, of Tiffin, Ohio, is building an entirely new system of motor-car sprinklers, one of the first of which will be used by the New York City fire department.

New York as a Commercial Car Center

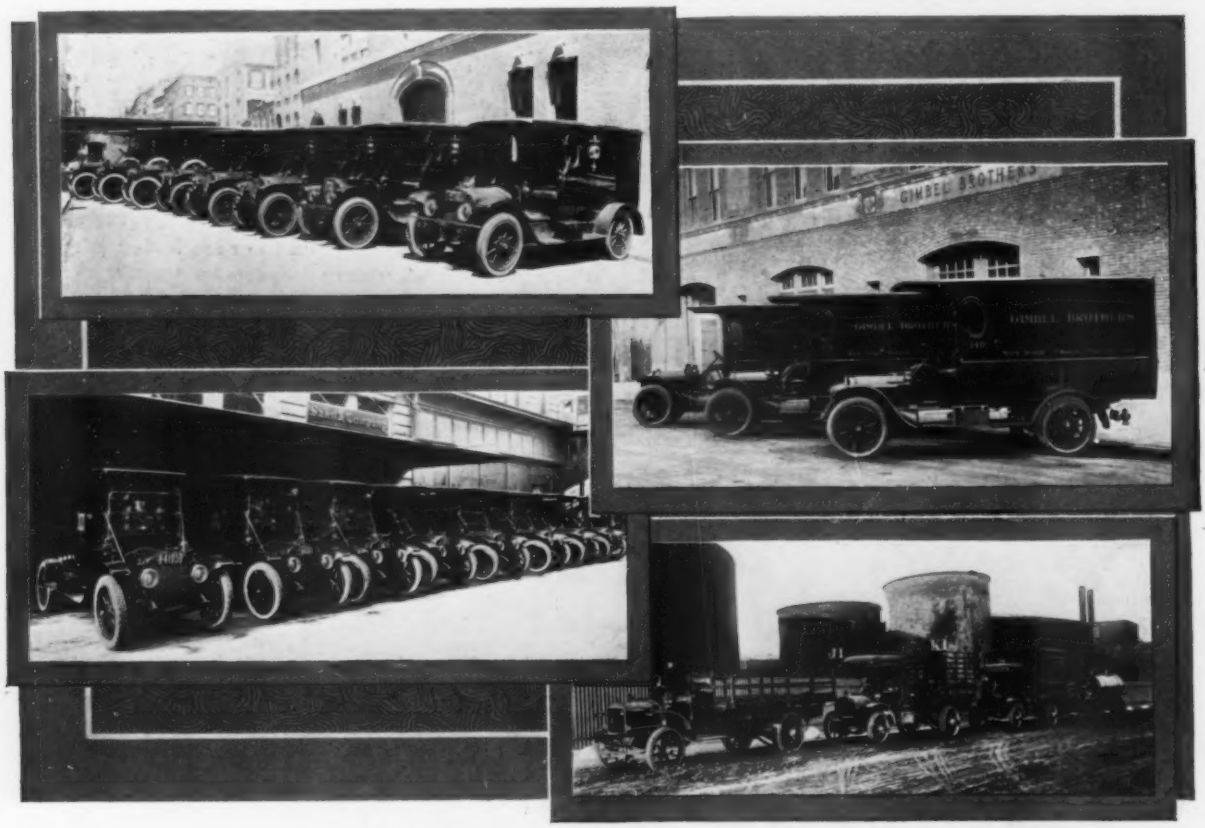
By CHARLES B. HAYWARD

IN line with its pre-eminence in the pleasure-car field, New York City likewise takes first place where the commercial car is concerned. Operating in the confines of what is usually known as the metropolitan district, there are as many commercial cars as in the whole German Empire. According to the 1913 census there were then a little over 9000 machines licensed for commercial use in Germany. On October 1, 1914, there were in operation in New York City, approximately the same number. The number is given as approximate as in the Secretary of State's office for this district are also included registrations for four counties outside of the six included in Greater New York, viz., Nassau, Suffolk comprising Long Island, and Westchester and Putnam, immediately bordering the metropolis on the north.

On the date in question, the total registration of commercial cars in these ten counties aggregated 10,860. Of this number, fully 90 per cent. are in New York City proper, so that the metropolis now has more than 9000 cars in service. This is about half as many as are in use in all of Great Britain, which according to the census of last year could only boast of 18,000 all told. New registrations run from ten to thirty-five per day, or between three hundred and four hundred per month. This, in itself, is far more significant and impressive than the huge total itself, as it indicates an annual increase of almost 40 to 50 per cent. and gives some idea of the tremendous capacity of the city as a market for the commercial car manufacturer.

Two or three years ago, it was estimated that there were 70,000 horses in service in the same territory. That is, the city proper. Of the nine thousand commercial cars now in use, fully 50 per cent. are trucks of from two to five tons capacity. As an automobile delivery wagon displaces two horses at the most conservative estimate, and the larger trucks are the equivalent of three to seven animals, it will be apparent that New York City's motor fleet represents the equivalent of between 25,000 and 30,000 horses. At the present rate of increase, New York City streets should be the cleanest in the world a few years hence, as the annual growth represents the hauling capacity of some 10,000 to 12,000 horses, which would otherwise be indispensable to carry on the city's delivery and trucking service.

In the nine thousand or more commercial cars now in use in the metropolitan district, there is represented every type from the motorcycle with side-car attachment of which class several are employed by the telephone company, up to the ten-ton tractor, quite a number of which are in the service of contracting companies. Between these two extremes there is everything that has ever been built for commercial use or that has been converted to that rôle after having outlived its usefulness in other fields. It would seem that in any such great aggregation of commercial vehicles, the lighter types such as delivery wagons would predominate, but an examination of the registration lists proves the contrary. Despite the great fleets of these smaller cars in the service of the department stores and other establishments requiring a house to house delivery, *the lighter machines are in the minority.* This is probably due to the fact that the advantages of the commercial car are not only more apparent in the transportation of freight and express matter, contractors hauling and the like but that these heavier vehicles are also easier for the large corporations to acquire than a delivery wagon is for the



White Fleets Used by Well-Known New York Concerns

The upper left illustration shows part of a fleet of thirty-five machines owned by B. Altman & Company, while below is seen a part of the ten machines owned by Saks & Company. Upper right shows White trucks used by Gimbel Brothers' department store, while the remaining view shows a few of the sixty-one trucks owned by the Standard Oil Company of New York. The Standard Oil Companies own a total of 193 White trucks.

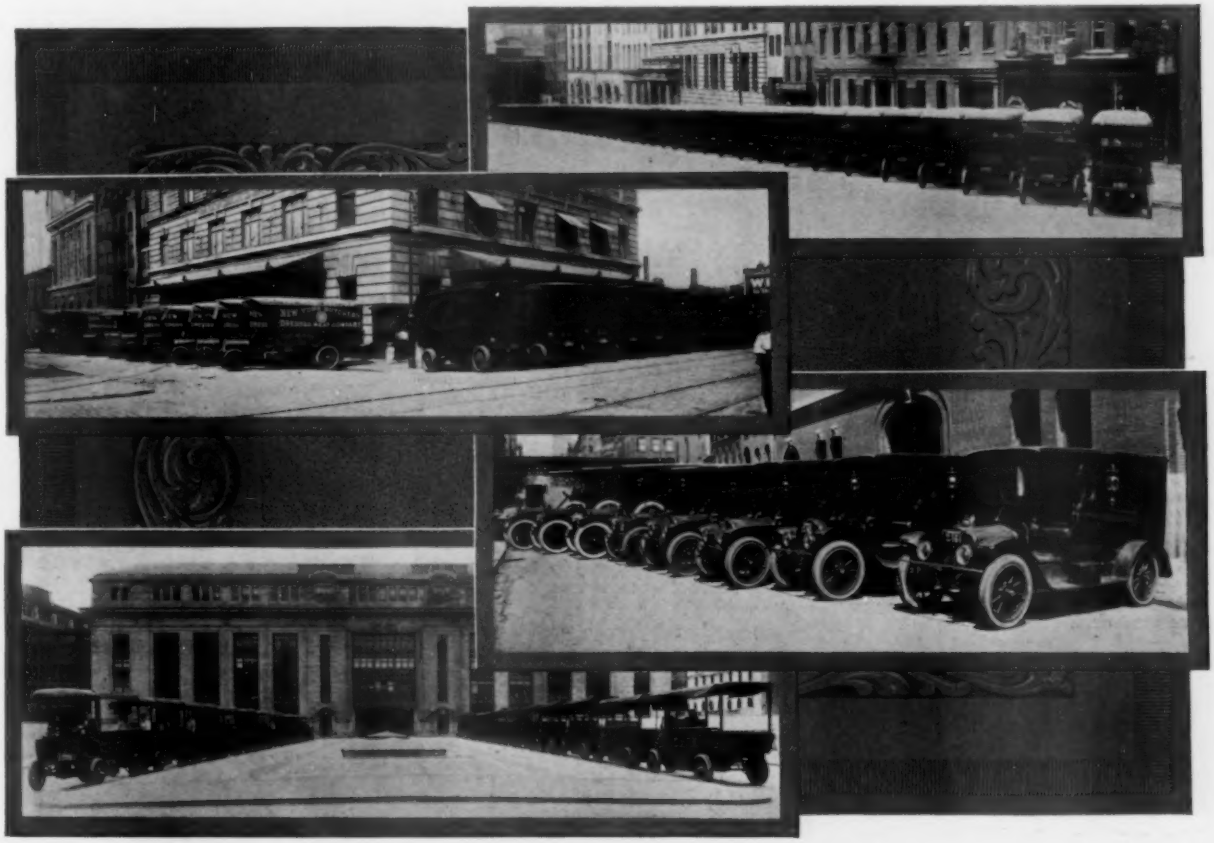
small storekeeper. *When the commercial car comes into universal use it seems likely that the present proportions will be reversed, as they are in the case of horse-drawn vehicles.*

New York lives up to its reputation for doing things on a big scale both in providing an unequalled market for the commercial car and, as a corollary, in being able to boast of the largest fleets of cars in the service of single establishments. Three leading makers, the Garford, Packard and White have a total of about 2000 cars in service in the metropolitan district, which from the maker's viewpoint also includes the urban territory on the west bank of the Hudson.

Grouping the registrations by the classes of service in which the cars are employed, it is found that the department stores lead in the number of cars used. The total is in round numbers seven hundred, about 20 per cent. of which are heavy trucks for the transportation of bulk loads to outlying stations, while the balance are delivery wagons not exceeding one ton capacity. Of the latter, fully 85 per cent. are electric. The express companies come next with approximately six hundred, but in this case the proportions are reversed, fully 75 per cent. or more of the total being three- to five-ton trucks. Brewers are a close second to the express companies, having over five hundred, practically all of which are heavy vehicles, usually of 5 tons capacity, and to a very large extent of the electric type. If it were left to even the most experienced commercial car man to point out the class of service, which next to the breweries, employs the greatest number of machines in the aggregate, it is very doubtful if he would select bakers. They can boast of something like four hundred. This can be accounted for, however, by the possession of one baking company of what is undoubtedly the largest single installation of motor vehicles in the city.

Contractors are next in order with approximately three hundred, all of which are heavy trucks, quite a few of them being ten-ton tractors. Furniture movers can boast of over two hundred three to five-ton vans, while wholesale grocers have about an equal number, mostly of 5 tons capacity. There are undoubtedly a baker's dozen of trades which will show an aggregate of a hundred or more commercial cars in service. For example, three New York City jewelry houses when grouped have at least fifty. The packing houses and the coal companies are also in this class, a comparatively small number of concerns in each of these lines having at least that many heavy cars. Two ice cream manufacturers use more than thirty heavy trucks for transporting their product, the rubber companies have about an equal number of lighter machines and so on down through the list. By digging out the individual registration, doubtless many more lines having fifty to one hundred or more commercial cars in service could be added to those already given, but it would be quite a task to segregate them from the total of close to eleven thousand.

It is in the great fleets of single establishments quite as much as in the high total of its registration that the metropolis leads the rest of the country. One firm has close to three hundred cars in service, three or four are not far from the two hundred mark, while several have in excess of one hundred. At the head of the list comes the Ward Baking Company with 293. There are 146 serving the Bronx branch and 147 at the Brooklyn plant. By far the greater number in both cases are light Ward electric delivery wagons, but for the suburban service a number of heavy gasoline trucks are used, the Kelly, Mack and Federal being well represented. The American Express Company with 181 trucks has a fleet that is much more impressive and of vastly greater carrying capacity. Prominent in its make-up are sixty-five two-ton Baker electrics, thirty-nine Packard, three- and five-ton trucks, thirty-two General Vehicle electrics and eleven Peerless, five-ton trucks, as well as a number of White, Velie and Alco trucks. The Adams Express Company has 151, comprising fifty-four Autocars, thirty-one Lansden electrics, twenty-four Alco trucks, twenty G. V. electrics, seventeen Packards and three White trucks. The Westcott Express Company has seventy-eight of which fourteen are Baker electrics, five Peerless,



A Few More Examples of Fleet Installations in New York City

six Packard, two each Studebaker and Atlantic trucks and the rest Alcos, while the smaller express companies have fleets of similar make-up, which though smaller in comparison with those mentioned are large installations in themselves.

There are 134 'buses operated by the Fifth Avenue Coach Company—rather a meagre showing when compared with the great fleets of the London and Paris streets—in times of peace. Probably just now there are more 'buses in evidence on New York's thoroughfares than on those of either of the old world capitals. The postal transfer service operates 118 cars, seventeen of which are G. V. electrics, ten are Sanford trucks and the balance Alcos. The Ruppert brewery has close to a hundred heavy machines, sixty-seven of which are G. V. five-ton electrics, twelve are General Motors, seven Bussing and four Saurer of the same capacity, while Mack, Commer, Daimler, Martini and others are represented. In fact, the brewers are quite as cosmopolitan in their selections as the express companies, the Lion Brewery having the White, Reliance, Metzger, Hewitt and Mack in gas cars, and the G. V.'s in electrics; while Ebling's has Atlantic, Knickerbocker and General Motors; Ringler has Bussing, Mack and Studebaker, though most are G. V.'s, while Ehrets fleet of eighty-nine is composed largely of the latter with some Lansden and Studebaker electrics as well. The Central Brewery and Doelger's have more than eighty with such makes as Universal, Packard, Autocar and Benz, beside G. V.'s.

The greatest number of large fleets is naturally in the service of the department stores. For example Gimbel Brothers have 113 of which sixty-five are Studebaker electric delivery wagons and thirty are White gasoline machines in the same classification, though of greater capacity. John Wanamaker has ninety-four, more than half of which are Autocars, twenty-eight are Ford delivery wagons and the balance are trucks, there being eleven Packards. Lord & Taylor have seventy, including twenty Pierce-Arrow, equally divided between trucks and delivery wagons, thirty-nine are G. V. electrics built to imitate gasoline-driven cars, and there are some White machines. An interesting item in this list of registrations is a Pierce-Arrow "wrecking" car. R. H. Macy's installations totals close to sixty, including eighteen Lansden electrics, fifteen Chase, two-cycle gasoline delivery wagons, fifteen G. V.'s and nine Mack trucks. B. Altman & Co. are close to this number with nineteen G. V., sixteen Buick, eight White delivery wagons and two Packard trucks. Loeser in Brooklyn has forty-six of which thirteen are Packard trucks and the balance, outside of a scattering representation of gas trucks, are G. V. electrics. Hearn, the Greenhut-Siegel-Cooper Company, Best & Company, Stern Brothers, and Saks have over 125 between them, including such makes as Anderson, Baker, Lansden, Walker and G. V. in electrics, and Autocar, Lippard-Stewart, Randolph, Decatur and White in gasoline cars. In addition to its eighteen Walker electrics, the Stern Brothers installation has the distinction of including what is probably the only foreign electric car in commercial service in the country, a Berliner Elektromobil delivery wagon.

A search through the voluminous records brings to light numerous registrations that give a far better idea of the great extent of the service the commercial car is rendering to a multitude of different companies than can be obtained by actually seeing the cars themselves on the streets. The telephone company has close to one hundred cars in service, from Indian motorcycles with side cars, Ford and Chase light delivery wagons to five-ton G. V. and Mack trucks. There are forty-four coal "wagons" in the service of Burns Brothers, several of them of 10 tons capacity and few of less than 5. About fifteen "ice wagons" help cool the product that is delivered by Horton's twenty "ice-cream trucks," half of which are Pierce-Arrow and Peerless five-ton machines. The Edison and United Electric Lighting Companies have 131 machines, mostly Anderson, Lansden, Baker and G. V. electrics, though some of them were made by the Electric Vehicle Company, while most of Tiffany's fleet of electric jewelry wagons date back to the Vehicle Equipment Company, the predecessor of the General Vehicle Company, which gives some idea of how long electric delivery wagons stay in constant service. Standard Oil handles "gas" and lubricants in bulk in its thirty-one trucks, of which twelve are White "tanks" and eight are sprinklers or road oilers, half of this number being of Peerless make and the rest International. One wholesale grocer, Butler, has twenty-eight five-ton trucks, ten Garford, nine General Motors and six Reliance. Twenty-five trucks are in the service of piano manufacturers, the Aeolian Company having seventeen, among which the Kelly, Knox and Chase are well represented. One carpet house has twenty trucks, of which sixteen are White and the balance G. V. electrics. It will be apparent that uniformity in equipment is not the rule, but there are exceptions to this, the Public Service Express Company having twenty-six Stegeman trucks in service. There are about forty-five newspaper wagons, the New York Herald having mostly a Renault special type, though three White cars have recently been added, while the Brooklyn Daily Eagle has fourteen Locomobiles, these two publications having over thirty machines between them.

And so it goes. There is scarcely a line of business that can be mentioned that is not discarding the horse. From movie "fillums" and supplies which are transported about the city streets by the Vitagraph Company in five one- to three-ton trucks, to the dynamite for the subway construction which reaches its destination in the Dupont Powder Company's bright red electrics with their danger flags, pretty much everything that New York City eats, drinks, wears or puts to other uses is now transported in its fleet of more than ten thousand commercial cars.

Champion Spark Plug Company, of Toledo, Ohio, has entered into a working affiliation with the Jeffery-Dewitt Company, of Detroit, in order to meet the increased demand for spark plugs. Under this agreement, the Champion Company will make the J-D and Reliance plugs, formerly made by the Jeffery-Dewitt Company, in addition to the Champion plugs. All business will be conducted from the Toledo plant, and the operations of the Jeffery-Dewitt Company will be confined exclusively to the manufacture of porcelain and porcelain products.

German Gasoline Shortage. It is reported that a serious shortage of gasoline is impending in Germany. Before the war Germany was trying to organize a scheme of transport by inland waterways from the Galician and Roumanian oil fields to guard against this shortage, but time did not permit these arrangements to be completed.

Opportunity for American Truck Makers. St. George's Motor Company, Ltd., 16 Fulham Road, South Kensington, London, Eng., is anxious to represent the makers of a good substantial and well-tried commercial car, who are not at present represented in Great Britain, and who would be capable of manufacturing and shipping about fifty or sixty chasses a month. Catalogs, prices (f. o. b. New York), trade terms and full particulars would be appreciated.

Start of World Tour in Denby Truck

On September 29th, a fifteen hundred pound Denby truck, manned by two hardy drivers, Beckwith Havens, former celebrated Curtis bird-man, and C. T. Chenevert, a truck salesman of long experience, started from the Hotel Pontchartrain, on a three years' trip around the world. The object of the cruise is to study transportation and trade conditions, place agencies, and to learn how to best apply trucks to the work of many countries through which they pass.

Motor Trucks of Pacific Telephone and Telegraph Company in Los Angeles

By FRANK REED

TWENTY-FOUR trucks are used by the Pacific Telephone & Telegraph Company, Los Angeles office, in construction and installation work. These trucks are: four Autocars, 3000 lbs., for delivery of material; three Buicks, two cylinders, 2000 lbs., in installation work, carrying wire, insulators, etc.; two Best, 1500 lbs., in installation work; nine Chase, 1500 lbs.; one Chase, 500 lbs.; three Chase, 2000 lbs., in installation work; one Mack, three-ton delivery of construction materials, cables, poles, etc.; one Velie, two-ton, for installation material delivery, also one Ford delivery car, 750 lbs.

The company uses a few pleasure cars for inspection and foremen. The Mack three-ton has been equipped with reinforced springs and is constantly used under overloads. It hauls 6 or 7 tons 5 days in the week and takes care of a great many construction emergencies; not only loads heavy reels of cable upon itself either from platforms or the ground, but is used to pull cable into conduits, haul poles (with a trailer) and set them up in the ground, haul camp wagons to points where construction crews are located, etc.

The two-ton truck, as a rule, is only loaded to about one-half the rated capacity due to working conditions. The capacity is actually needed once a week or, during some considerable periods, only once in two weeks, but then conditions arise under which a smaller truck would not possibly do, and if the company did not own a truck of this size, it would be put to the inconvenience of hiring one, and if none were promptly available, would suffer more than it does from having unemployed capacity in the interval. It is considered that the truck fully justifies its expense, as in ordinary use it replaces three horses and wagons, needing no larger gang than one of the wagons which it replaces. The small trucks on service work are never heavily loaded and do not make much mileage, seldom over 25 miles a day. They make good in the reduction of the time intervals between jobs, giving constant employment to the men, making it possible to avoid delays due to men running out of materials while on the job, giving prompt service to their subscribers, who are always anxious to have telephones installed promptly after order is placed, and other items of this character.

Pacific Telephone and Telegraph Company Truck and Trailer Hauling Telephone Poles

One of the Company's Three-Ton Trucks Carrying Four Tons of Clay Conduit
No trouble from breakage

One of the Company's Trucks, With Trailer, Hauling Seventeen 35-Foot Poles

During the spring floods of last year the trucks of this company, like those of the other public utilities operating in this section, proved themselves indispensable and enabled the construction crews to obtain wonderful results in restoring service promptly where the plants were badly shattered. One particular case was the restoration of service on an important group of toll lines. Toll service means money to a telephone company. As the wires are busy with paying messages practically all

Showing Mack Truck Equipped With Derrick, Picking Up Forty-five Foot Pole

the time during the day, and as each toll line serves many patrons, the loss of facilities for even a few minutes is a serious matter. When this lead was brought down by the flood conditions, a reel of cable of a special type, known as emergency cable, was loaded and rushed to the scene of the accident, the cable unreeled directly from the truck and in a very short time joined up to the ends of working wires at each side of the gap, and service restored through these temporary facilities until new poles could be erected and the gap bridged properly with open wire.

This View Shows Men Putting Up New Cable, Brought by Truck, While Fire That Destroyed Old Cable Still Burns

Mack Truck Loaded With Complete Camp Equipment, Commissary Supplies and Fourteen Men, Tools and Material, on the Way to Repair Toll Break Thirty-Five Miles North of Los Angeles

Another incident:

Fire in a business district completely burned out a cable, putting out of service every telephone connected. Material and men were rushed aboard a truck, which was hurried to the scene of the fire, and new cable was put up and placed into service while the fire was still burning itself out; something which would have been impossible with horse transportation.

The big truck with a trailer takes care of a good number of the larger-size poles, transporting them to any distance required with great promptness. During the flood times the capacity and speed of this truck were utilized to the fullest degree many times, and gave even more satisfactory service in these trying times than in regular daily work.

Pacific Electric Railway Maintenance of Way Dump Truck on Patching Asphalt Paving in Los Angeles

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Kissel Motor Car Company, Hartford, Wis., recently shipped fifty chassis, and the Charles Abresch Company, of Milwaukee, fifty bodies to the Greek Government.

Mais Motor Truck Company, Indianapolis, Ind., has decreased its capitalization from $1,000,000 to $200,000.

Motor Truck Design and Construction Made Plain

Advantages and Disadvantages of Different Types Discussed

By C. T. SCHAEFER, Member Society Automobile Engineers

This is the twelfth installment of a series of articles by this well-known writer, covering in a non-technical way the various constructions now current practice in commercial car design. These articles will take up, in order, the general types of chassis, the advantages and disadvantages of each, illustrated by simple diagrams, and in logical order, motor construction, ignition, carburetion, cooling, lubrication, etc., until each part of the truck has been dealt with.

PART XII

THE CLUTCH

THE defects in the gasoline engine, relative to its flexibility, have been previously mentioned. Among these is the inability of the motor to develop its full torque from a standstill. The crank shaft of the motor must rotate at a speed consistent with power requirements, while the road wheels must rotate consistent with road conditions, or as the operator wills. For this reason it becomes necessary to use a transmission. The motor must be started by a hand crank, or some starting device, which only produces enough torque to just turn the motor over against compression, so that it becomes necessary to disconnect the motor from the other driving units of the vehicle for starting and after the motor has attained its speed to connect it with the vehicle again.

For this purpose a device must be used, which will allow a certain amount of slippage until the motor speed has been reduced and the vehicle speed gradually accelerated to such a point that the two correspond, in this way preventing shock and jar to the driving mechanism.

This feature is accomplished by the clutch, which is most generally placed in close proximity to the motor. The most popular position is inside the fly-wheel, but there are some commercial cars on the market in which the clutch is mounted in a housing which is integral with the transmission. In commercial cars a single clutch is generally employed, which serves to connect the engine to the driving wheels through all of the different gear reductions. It is normally held in engagement by a single spring of large diameter, or by a number of smaller springs, and is controlled by a foot pedal to disconnect it from the motor by releasing the friction surfaces, thus disconnecting the power of the motor from the driving units. When it is desired to disconnect the engine in order to stop the car, or to change the gear, the clutch is first disengaged by foot pressure upon the pedal, which compresses the spring; the gear is then disengaged or changed and the clutch let in again.

There are quite a number of different types of clutches, all more or less extensively used, as follows: Conical clutches of the indirect or direct type, multiple disc clutches, dry plate clutches, band clutches, and combinations of cone and disc type. The construction of each type varies considerably in details of design and the materials used for the frictional surfaces.

In light commercial cars of 2000 lbs. capacity, or under, there is a tendency to use the unit power plant, in which the motor, clutch and transmission are always held in alignment, while on the heavier types the transmission and jack shaft are combined in a unit. With the latter type it is necessary to use a double universal joint between the clutch and transmission units. The universals take up any misalignment due to frame weaving. In some cases they are bolted to the clutch, spider or spigot, while in others they are built into the clutch center. This latter construction seems to be gaining favor with multiple disc clutches which operate in oil, a portion of which is distributed to the universal, causing it to be self-maintaining.

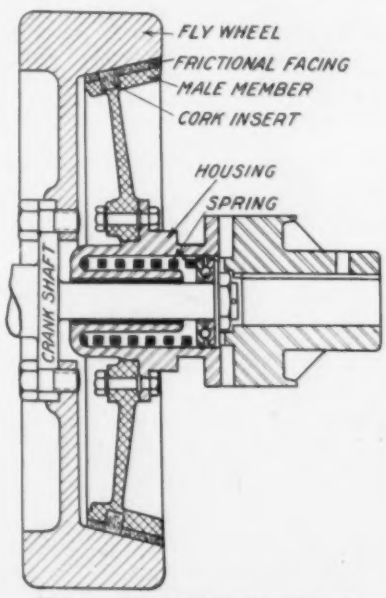


Fig. 1. General Construction of Direct Cone
A single large spring is used

A variety of methods are resorted to for mounting the clutch on the spigot, plain, ball and roller bearings being used for this purpose.

There is also a tendency to provide clutch brakes so that the tendency of spinning caused by the inertia may be reduced to facilitate gear shifting.

Cone Types

Among the conical clutches we find two types in general use, direct and indirect types. Either type consists of a male and female member, the male member being forced into the female member by the pressure of the spring or springs. When one spring is used, it is attached to the clutch spigot and when a number of small springs are used they are attached to a spider, which is free to float on the clutch spigot. The action of the clutch members is similar to a wedge movement. It is the oldest type and also the simplest type in use at present. The fly-wheel generally forms the female member for the direct type, while the male member may either be made from aluminum or pressed steel and covered with a material such as Raybestos, leather, etc. In the indirect type it is necessary to bolt the female member to the fly-wheel. The clutch spigot may either be an extension of the crank shaft or it may be bolted to the fly-wheel.

Fig. 1 serves to illustrate the general construction of the direct type. The male member is provided with cork inserts to obtain a higher co-efficiency of friction and is bolted to a cast-steel housing, which is mounted on the clutch spigot and surrounds the clutch spring. The spigot is formed by an extension of the crank shaft, and is provided with a thrust bearing.

The cone clutch, depicted in Fig. 2, differs from the above in that three small springs are used. These small springs are supported on studs, which are riveted to the clutch spider. The spider is provided with a die-cast babbitt bearing instead of a cast-bronze bearing. It depicts a type which is generally incorporated in the unit power, owing to its short length, which is a desirable feature.

An indirect type of cone clutch is shown in Fig. 3. The male member is made of aluminum and is provided with a frictional lining and cork inserts. Small pieces of rubber are placed under the lining to obtain a smooth and gradual engagement. The female member is made of gray iron and bolted to the fly-wheel. It also forms the retaining member.

The spigot is bolted to the fly-wheel and provided with a bronze bearing, while a roller bearing is used as a thrust bearing, and the disengaging collar is provided with a ball-thrust bearing. Cone clutches of both types are also provided with flat springs, or plungers, and coil springs, which are placed under the frictional facing, the object being to prevent the tendency to jerk when first engaged. The friction material is, in most cases, riveted to the male member, while in a few cases T-head bolts are used to facilitate its replacement, while one or two makers rivet it to the female member.

Multiple-Disc Type

Multiple disc and plate clutches are based on the same principle as the cone clutch, but constitute in a sense extreme opposites in design. The multiple disc clutch is undoubtedly second to the cone clutch in popularity, if not first. This type offers several advantages not found in the others, being the most compact. The required frictional surface is obtained by a multiplicity of small surfaces, in preference to two large ones, as in the case of the cone and plate types.

A disc clutch consists primarily of two sets of discs, one set being termed the driving discs and the other the driven discs.

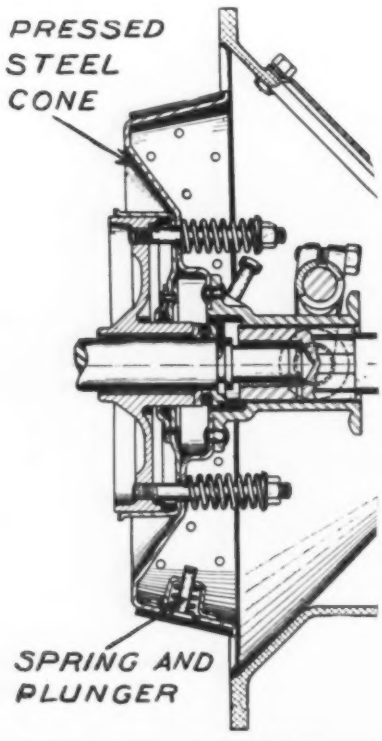


Fig. 2. Cone Clutch With Three Small Springs

The driving discs are generally provided with key slots on their outer circumference, which fit over hardened steel keys riveted to the inside circumference of the housing bolted to the fly-wheel. The driven discs are also provided with key slots, but these are placed on their inner circumference, which fit over keys riveted to a housing attached to the driven shaft. It is general

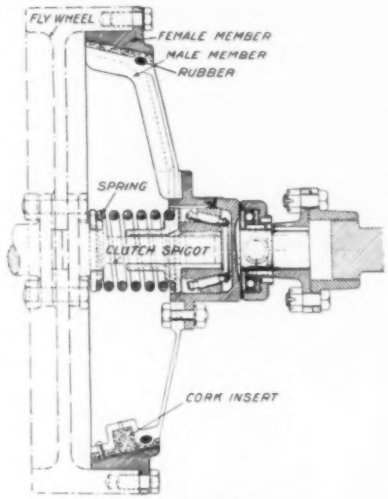


Fig. 3. Indirect Cone Type

practice to use one more driving disc than there are driven discs, so that the two end discs may be of the same kind. The driving set is driven by the engine, while the remaining set is attached to a continuation of the transmission shaft. In some cases small flat springs are used to keep the discs apart under conditions where it is desired to render the clutch inoperative, that is, when the spring pressure is removed from them.

It is usual practice to enclose a clutch of this kind in an oil-tight case, which insures that the members will operate in a constant bath of oil, meaning long life of the frictional surface as well as gradual engagement. Owing to its comparatively small diameter, the inertia is not very great and gear shifting is somewhat easier than with the cone clutch. The spring pressure is great enough, so that when engagement is made the oil will be squeezed from between the plates and the frictional surfaces brought into contact. As the oil is gradually squeezed out, and as there will be a certain amount of slippage as long as any considerable amount of lubricant remains, the power will be applied gradually.

A multiple disc clutch, which is extensively used in commercial cars in this country and abroad, is the Hele-Shaw clutch, illustrated in Fig. 4. The discs are made from steel and bronze, with V-groove corrugations. Only the walls of these grooves come in contact and the remaining portions of the disc serve to radiate the heat engendered during slippage. To permit the oil to enter and escape freely, these discs have small holes drilled in the inner walls of the grooves near the peak. The action obtained by these grooves is a wedge action similar to the cone clutch. This also illustrates a design in which pressed steel is used wherever it is possible to do so. The clutch is of the universal type, having an external and internal gear type of universal, mounted inside of the clutch. A clutch brake is also provided to facilitate gear shifting, this brake being mounted upon the drive shaft and adjustable for wear.

Another type of universal multiple disc clutch is shown in Fig. 5, which differs from the one described above, in that the discs are provided with cork inserts, while the universal joint is of the block and trunnion type.

Fig. 6 is a type of multiple disc clutch used in connection with unit power plants. It is built onto an extension of the transmission shaft, one end of which is supported by a ball bearing in the fly-wheel. The frictional surfaces consist of saw-steel driving discs and Raybestos-lined, steel-driven discs. The construction is similar to those described above, excepting that two large springs are used, one being placed around the other and retained by three bolts, which provide adjustment for the spring tension.

Dry-Plate Type

The dry plate clutch is similar to the multiple disc type; however, the discs are of a much larger diameter and but three or five plates are necessary. The driving discs are either Raybestos rings or bronze plates with cork inserts, while the driven discs are made of steel. These clutches are not designed to run in oil, but are more liable to considerable wear because of the amount of contact surface provided.

A three-plate clutch of conventional design is shown in Fig. 7. The face of the fly-wheel forms one surface, while a moving

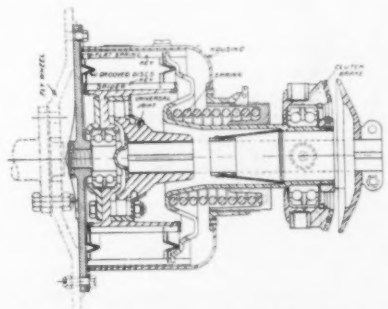


Fig. 4. Hele-Shaw Multiple-Disc Type

member forms the other. Between them is a floating member which is keyed to the transmission shaft. Pressure is obtained from a coil spring acting on a sleeve which brings the outer plate into engagement with the floating plate through the cam lever. The transmission shaft is mounted on a ball bearing in the fly-wheel and is free to revolve therein, therefore, when the spring pressure is released, the transmission shaft will remain stationary, while the fly-wheel revolves.

Band Type

Band clutches are practically the same in general principle of operation, as band brakes, and are of the same general types, internal expanding and external contracting. This type of clutch is not very popular, and but few can be found on commercial cars at present.

Combined Types

The Wells clutch, Fig. 8, is a combination of the cone and disc types. The body of the clutch is a hollow cylinder bolted to the flywheel. To this hollow cylinder is fitted a cover, which engages by means of inter-

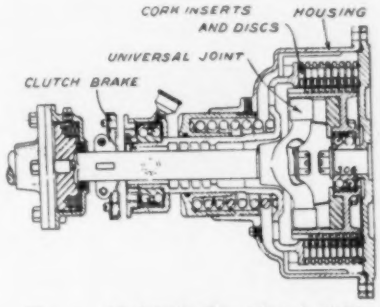


Fig. 5. Multiple-Disc Clutch With Cork Inserts

nal threads, and provides for adjustment which is altogether external. The inner surface of the cover, together with the bottom of the chamber and a steel disc, keyed to the body, form the driving members. Opposing them are an equal number of driven members, keyed to the transmission shaft. In operation these members are firmly locked together by means of a compound wedge movement. Immediately under the cover are located two metal discs whose opposing faces are concave. Between them are four wedges which together form a disc, having convex surfaces corresponding in angle to those of the concave discs. In operation these wedges are expanded radially by a sleeve surrounding the shaft. This sleeve has a tapered end, fitting into a tapered hole in the wedges. They in turn expand the discs in a longitudinal direction and locks all members, giving a positive driving effect. The friction surfaces are bronze against iron, and Linobestos against steel.

There is a tendency on the part of manufacturers to use ball bearings for supporting clutches of all types, as the plain bearing is hard to lubricate effectively and the friction of same tends to produce dragging. The ball bearing can be more easily lubricated, requires less attention and eliminates this dragging evil.

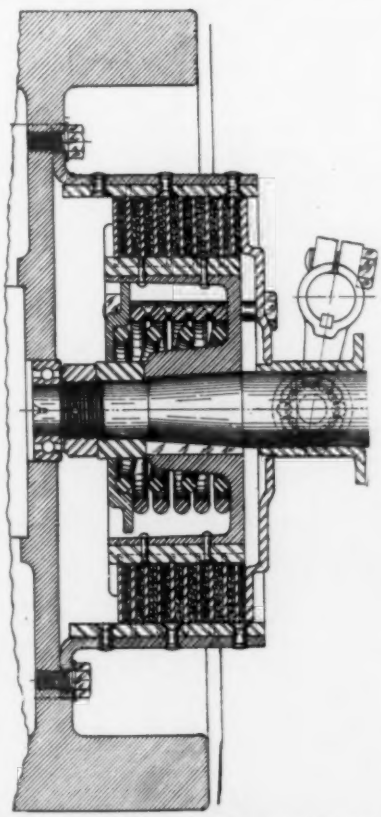


Fig. 6. Type of Multiple-Disc Clutch Used in Unit Power Plants

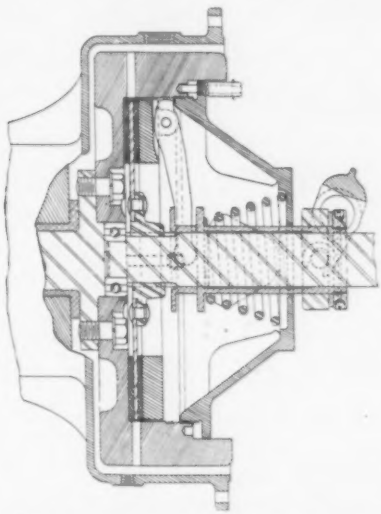


Fig. 7. Three-Plate Dry-Plate Type

Comparisons

The advantages of the cone clutch are that it may be engaged and disengaged with very small axial motion, axial pressure may be low because the normal pressure between frictional surfaces is multiplied by the angularity of the cone, its weight is not very great as the male member may be made of aluminum or pressed steel, its engagement is entirely independent of speed and centrifugal force, no liquid lubricant is needed with attending viscosity, drag and change due to wear and temperature. Disengagement may, therefore be made perfect. The chief disadvantage of this clutch is its size, it being more bulky than the other types with the possible exception of the dry plate type. Inertia is also a disadvantage, as this must be as small as possible, in order to make gear shifting easy and to avoid gear clattering.

These objections led to the introduction of the multiple disc clutch, in which the frictional surface can be made larger and the frictional force smaller per unit surface. The chief disadvantage of multiple disc clutch is its tendency to drag if the oil in the clutch housing is not suitable for the purpose. Most makers recommend a light machine or cylinder oil and kerosene. It can readily be understood that the thinner the lubricant, the better the clutch will hold, while the more viscious lubricant will permit it to pick up its load more gradually.

To overcome the dragging evil, the dry disc type was introduced. The surfaces are not lubricated but are most generally provided with cork inserts in order to increase the coefficient of friction. This clutch has its disadvantages of inertia, similar to the cone type.

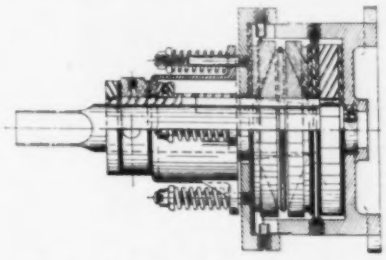


Fig. 8. A Combination of Cone and Disc Types

The combination of dry plate and cone has the features of the dry plate, its tendency to gradually pick up its load and the holding power of the cone after it has assumed its load. It is also simple in construction. However, it requires frequent adjustment.

At the present time, the cone and multiple disc clutches are by far the most popular and seem to be holding their own, with all the new types which are being experimented with.

NEW MOTOR TRUCK ROAD FOR PANAMA CANAL FREIGHT FOR LOS ANGELES

Panama Canal steamboat traffic to Los Angeles Harbor, at San Pedro, 23 miles from the city, has crystallized the demand for a motor truck highway from city to port. The county engineer acting under instructions of the Board of Supervisors, has begun to make a survey and estimate for such a highway. It will follow a special route, leading directly from the center of the wholesale and manufacturing district of the city, and running parallel to the Southern Pacific tracks a large part of its length. Construction will be of a type to stand up under the heaviest loaded trucks, equipped with trailers. Business men, both of the city and the harbor, are urging its early completion.

The steamship companies have adopted the policy of making deliveries at the wharf, instead of in the city, and have quit absorbing the rate for the local rail haul, as was done before the canal opened. Traffic experts say that this policy will result in the gradual transfer of the warehousing business from Los Angeles to the water front, but its immediate effect is to stimulate automobile transfer.

As the country between the city and the port is level, it is admirably adapted to a motor-truck haul, and existing service proves the efficiency of the trucks, as they speed up delivery, and save expense of several handlings incident to rail haul. Discussion of the subject is very active in Los Angeles at present, and the situation is enlivened by the announcement of a well-known transfer company, that it will enter into competition with both railways and auto trucks, for the port traffic, using mule teams as its mode of transfer.

Relative Merits of the Semi-Floating, Three-Quarter, and Full-Floating Rear-Axle Constructions

By ARTHUR M. LAYCOCK, Chief Engineer, Sheldon Axle Company

EDITOR'S NOTE.—Mr. Laycock is a strong advocate of our form of axle construction as shown by his article which follows. There are doubtless many designers who do not agree with all of his views as herein expressed. We shall be glad to accord space to any such, just as we have to this writer.

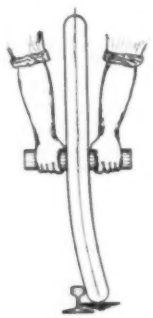
AT THE present time there are unquestionable fallacies as to the relative merits of the Full vs. Semi-floating construction as applied to the automobile, but it is rather difficult to convey to the reader an intelligent expression of these designs without resorting to higher mathematics.

Some of the illustrations are very simple in order to drive home the outstanding superiority of the semi-floating construction, particularly so when one takes as a base the forces acting on the side of the wheel instead of the straight static loads. One cannot attach too much importance to the advisability of working from this base.

Designs Caring for Static Loads Not Sufficient

It is utterly impossible to expect any trouble on general design from straight rolling loads no matter how much they are overloaded, but the moment the wheel strikes a large cobblestone a glancing blow, brushes against the curb roughly, or even only side skids on a good asphalt road, the pressures on the bearings and tubes are tremendously augmented.

Take a five-ton truck with 25 per cent. overload on a country road where the ruts are rather deep, and observe the way the rear end will slew around from one rut to another, and in some instances the whole dead weight is stopped in its side swing with the side of the rut, one can only imagine what enormous stresses are set up in the parts influenced, even when only running from 12 to 15 m.p.h.



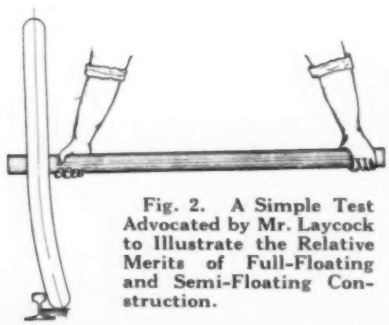


Fig. 2. A Simple Test Advocated by Mr. Laycock to Illustrate the Relative Merits of Full-Floating and Semi-Floating Construction.

We will take the other extreme—the same five-ton machine operating in the downtown districts where it is subjected frequently to turning corners at fair speed and skidding against the street car tracks and curbstones, it has been proven conclusively that these same machines have much more bearing and axle troubles than the ones that have to run on long straight-away runs to outlying districts, taking the same chassis and running under almost identical conditions, with this exception.

The writer has in mind a fleet of large trucks operating in Chicago at the present time, and this certainly proves beyond any shadow of a doubt that these forces are the only ones to take into consideration and not the static load act—in a vertical direction on the axles.

You will notice from Fig. 1 that the dotted line representing the static load is practically half of the maximum bending moment. Superimposing another diagram with the car skidding in the opposite direction, we obtain a total load diagram which would indicate that the center of the axle can be considerably smaller than under the spring seat, while in practically all existing designs, the axles are made the same section from spring seat to spring seat, and in a good many instances—particularly in front axles—the axle is only made heavier in the center for manufacturing reasons, while on the other hand, we have one or two notable exceptions in the light car class, which design follows very closely the maximum bending moment line and not the static load; in other words, where the greatest strength is required for the least weight, an axle designed to follow this maximum load line is the only one that will stand the close scrutiny of exacting engineers, and while the subject of front axles is quite foreign to the semi- and full-floating question, it is rather interesting to note that these forces have actually been studied, and that the design of some of our most popular front axles has been based upon these forces acting at the rim of the wheel and not the straight static load.

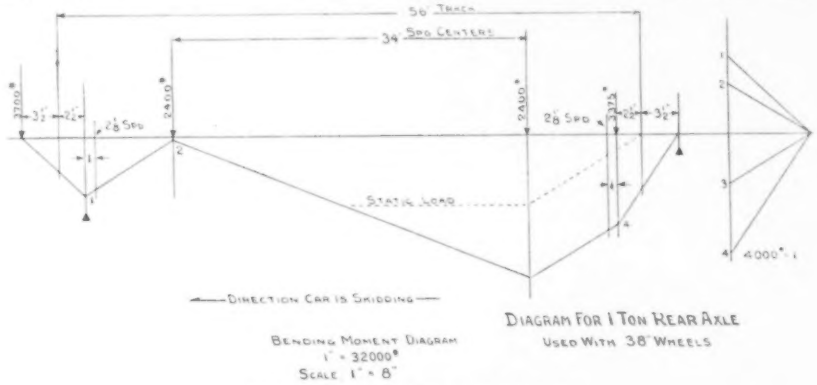


Fig. 1. Bending-Moment Diagram

Taking this for granted, one can very plainly see at a glance the relative merits of the two constructions as shown by Fig. 2

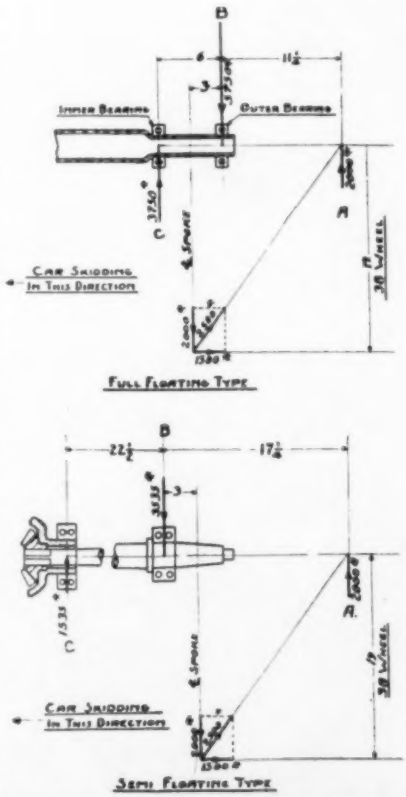


Fig. 3. A Very Simple Graphical Method of Comparing the Two Constructions

It would be an absurdity for anyone to attempt to hold the wheel straight up when rolling against the street car track in the manner as shown in the upper illustration, and in the writer's estimation, the lower figure is the only way to counteract these forces.

Fig. 3 shows a very simple graphical method of comparing the two constructions.

It might be well to note in the first place that this is approximately a one-ton

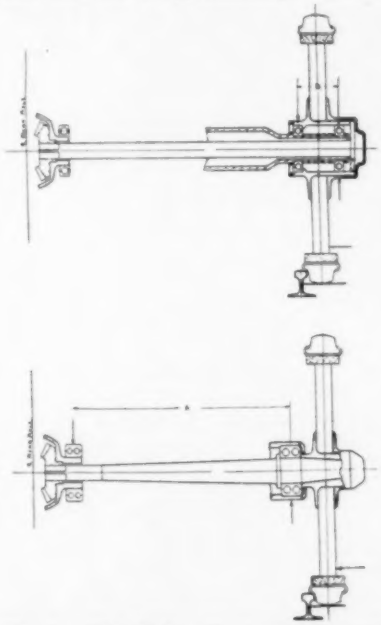


Fig. 4. The Writer Contends That the Upper Construction Can Never Withstand the Side Pressure That the Lower One Can

rear axle with 2000 lbs. on the spoke line and that the full-floating design has a very liberal center-to-center distance for a one-ton truck, which, of course, shows up this construction very much more favorably than if the center-to-center distance had been less as in a good many existing designs.

Taking the upper illustration, Fig. 2, it will be noticed that we have 2000 lbs. on the spoke line, the horizontal component of which is 1500 lbs. with a co-efficient of friction of 75 per cent. on the road, the resulting component being the diagonal of a parallelogram or 2500 lbs. This continued until it strikes the axis of the axle gives a vertical component of 2000 lbs. acting on a 11¼-in. arm. It is easy to see that this is now resolved into a simple beam with a force of 2000 lbs. acting at "A," and a reaction of 3750 lbs. at "C," and the sum of these loads acting in a vertical direction on the outer bearing at "B." Now, it is interesting to note that this pressure is as great as 5750 lbs. while a choice of bearing is undoubtedly made for 1000 lbs., seeing that the vertical load on the spoke is 2000 lbs. for the two bearings or you will notice under these conditions the outer bearing has an overload of 475 per cent.

Now, taking the semi-floating construction and following it through in the same way, you will notice that "A," "B" and "C" again represent a simple beam, a vertical upward force of 2000 lbs. and a reaction of 1535 lbs. is the total pressure on the bearing "B" acting in a downward direction.

You will notice a very radical difference between this construction and the upper one inasmuch as the reactions are taken on 22½-in. centers against 6-in. on the full-floating type.

It is also well to notice that a choice of bearing would be made here for 2000 lbs., which, of course, would give one a very much larger bearing.

Taking the bearing at its rated capacity this bearing under these extreme conditions is only overloaded 76 per cent. against 475 per cent. on the full-floating, while the illustration as shown on Fig. 4 shows a fair balance in design for each construction, but with this great difference that the upper illustration can never withstand the same side pressures that the lower one can.

Building a full-floating type axle with the same factor of safety on the bearings as in the semi-floating, it would have to be in about the same scale as shown on Fig. 5.

You will notice in this diagram—which is self-explanatory—that the bearing cost is quite an item and one of the principal reasons the semi-floating has not had a larger following is from the fact that our leading axle manufacturers usually sell bearings as well.

In order to arrive at these pressures as shown on Fig. 5, the method as shown on Fig. 6 could be used.

The tables as shown on Fig. 7 give a good general idea as to the maximum loads on the bearings when side skidding, as compared to the static. Take for instance the axle as depicted, Model Number RA-30. The maximum load on this hub is 5860 lbs. This, of course, is carried on two bearings —the inner and outer. This gives 2930 lbs. on each bearing, while when side skidding the outer one is subjected to a load of 15,085 lbs. and the inner one to 15,910 lbs. Now,

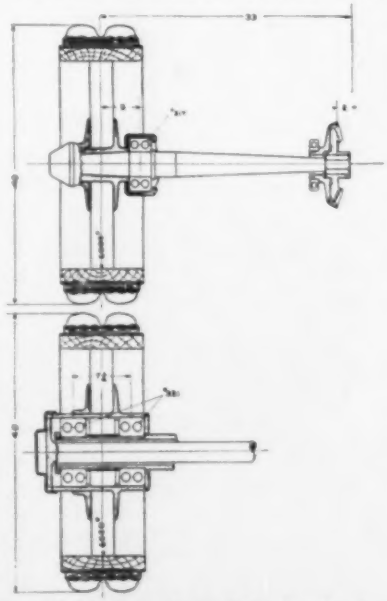


Fig. 5. A Comparison of Bearing Equipment Neccessary on the Two Constructions

this is approximately five times the static load. In going through all these tables you will find this is a fair average figure. Every one of these axles have liberal center-to-center distances of bearings. Of course these figures neglect sprocket pull, spoke and rim location and can only be used in a general way.

There are axles at the present time on the market with almost half the center-to-center distance of this particular one,

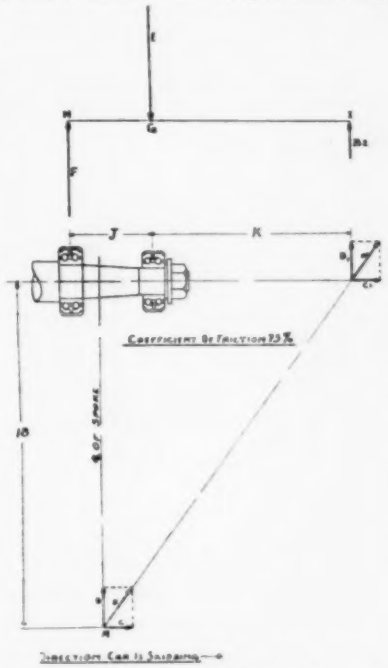


Fig. 6. Method of Arriving at Pressures Shown in Fig. 5.

and instead of being five times the static, they approach ten times the static.

In speaking of the center-to-center distances, this is indicated by "J" on Fig. 6.

Turning now to Fig. 8, you will note that this particular drive shaft is well taken care of on the spoke line. It is purposely weakened at the inner end so that in case of failure you can always be brought home on the wheels. The semi-floating construction as shown may suffer in the same way, as the double side chain drive, when an axle breaks the truck is absolutely disabled and not able to get home. In designing an axle in this manner, the writer has never known an axle to break under the wheel.

The stress, as shown here, is derived from a 50 per cent. overload with 80 per cent. on the rear, and even under these conditions, it will be impossible to break the axle on the spoke line.

Some of the fastest cars in the world have held tenaciously to this construction. Take, for instance, the Blitzen-Benz, unquestionably the fastest car built, and where the greatest possible strength for the least weight is desired one must of necessity take this construction, while one of our most popular one and a half ton live axle drive trucks—the White—has given such an excellent account of itself in real rough work together with some of the most expensive cars built. Take, for instance, the big Pierce-Arrow six-cylinder

machines, which, due to their great weight, must of necessity have a very rugged axle constructon. They have used this constantly, even for their earliest designs. Taking the other extreme—the Ford machine—it would be impossible to design a rear axle construction stronger than this one, for the same weight and price. These people must have had an early appreciation of the robust strength of this design.

It might be well to mention the three-quarter-floating at this point where the static load is taken on the tube and drive is taken through the shaft. This, of course, is in a class between the semi- and full-floating type. The popular erroneous idea with reference to the three-quarter-floating is in regard to the drive shaft being sub-

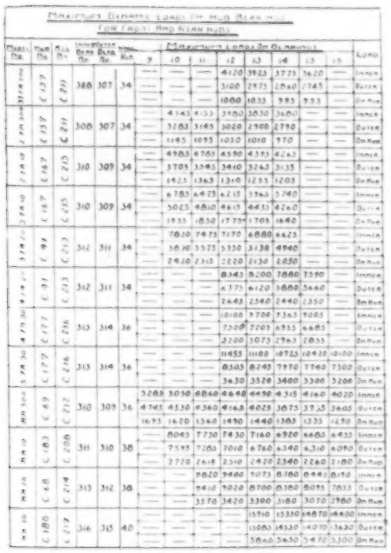


Fig. 7. Table of Maximum Dynamic Loads on Hub Bearings for Front and Rear Hubs

jected to purely torsional strains, but it can be easily shown that the drive shaft is taking the combined bending and torsional strains as in the semi-floating construction, and the only advantage the three-quarter would have over the semi would be that you can take out the drive shafts without jacking up the car as in the full-floating type, but with this very great difference that the whole load is supported on one bearing momentarily, and if the car is standing on uneven ground the pressure on the end of the tube and bearing might be so great as to permanently injure it, and figuring that the drive shaft is a critical part of the construction, and taking into consideration that in order to have it safe, it must have a very large diameter and when these dimensions are realized, one has to add to this already liberal size twice the thickness of the tube plus the clearance, one can imagine the very large size of bearing that this particular construction entails, which, while it might be taken from the lighter series, entails such heavy housings, etc., that it makes it undesirable from this viewpoint.

The writer has been repeatedly told that it has a further advantage of being able to get home on the one bearing in case of drive shaft failure. When this occurs

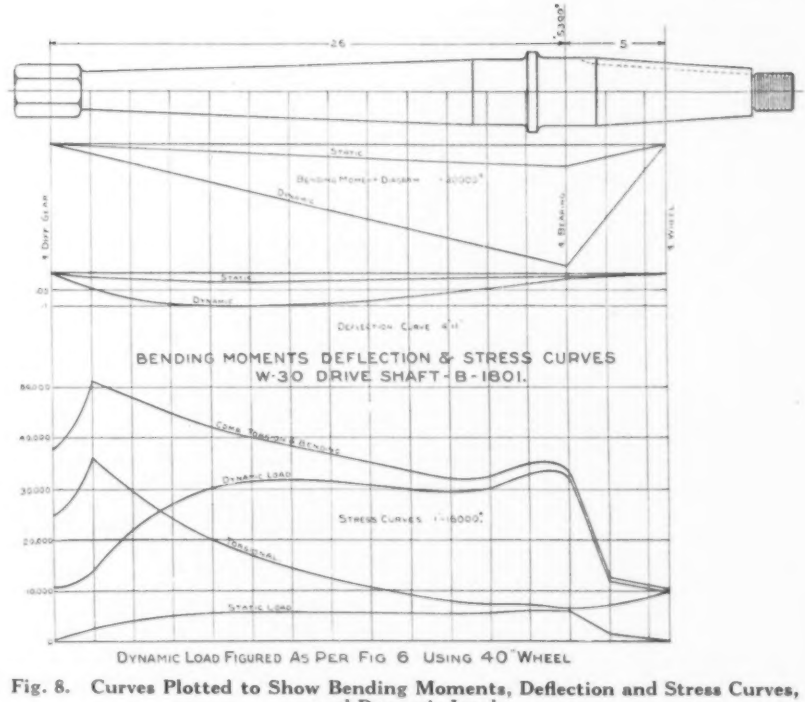


Fig. 8. Curves Plotted to Show Bending Moments, Deflection and Stress Curves, and Dynamic Load

on rough roads, it is an experience never to be forgotten, as it usually ends disastrously not only for the bearing, but for the axle tube as well. The absence of support throws such a pinching action on the bearing that it is not long before it collapses entirely and brings the closure down on the tube cutting off the tube and finally dropping the whole load.

The only disadvantage of the semi-floating construction is the inability to take the drive shaft out without jacking up the car, but in some of the earlier types of axles it was exceedingly difficult to do this on account of first having to split the rear axle in order to release the inner end. Modern construction, of course, makes it comparatively easy to take out the differential when the side shafts are withdrawn, and all that is necessary on a nicely designed semi-floating construction axle is to jack up the rear end, undo two bolts on each hub, take out the differential and the drive shafts can be taken out quite easily, but due to the great factor of safety that a properly designed semi-floating construction ensures, the axle is about one of the last things to give trouble.

The writer has had considerable experience with this form of drive, and wherever the combined bending and torsion have been properly taken care of, he has yet to see a single failure at the wheel end, and in these days of light weight construction, we prophesy that it will have a much larger following than in the past.

White 'Bus Used by Chicago, Waukegan and Fox Lake Traction Company, Genoa, Ill.
Flanged railway wheels permit the operation of the truck on the company's lines

Brooklyn Water Supply, Gas and Rapid Transit Companies Consider Trucks Invaluable

IN Brooklyn, five Autocars, one one and a half ton Mack, and one one and a half Grabowsky, are now employed in the water supply, gas, and electric distribution work of the Department of Water Supply and Electric Distribution, Borough of Brooklyn. The first of these cars was purchased in 1912, the others in 1913 and '14, and next year it is believed that fifteen or twenty more trucks will be put in service. Those in charge of the vehicles state without hesitancy whatever that the efficiency and economy of these cars over former methods is not questioned. Each truck replaces three horses and three wagons. Two of the trucks are at work on what are known as the watersheds, and travel from one pumping station to another with all kinds of materials, tools and supplies. There are four repair companies stationed at outlying points which maintain everything in their vicinity in connection with keeping the water supply and gas mains in good condition. Each of these has its superintendent, etc., and is served by the trucks which deliver materials, pipe, men, etc., when needed.

Autos Answer Fire Alarms

Autocars are fitted as emergency trucks, and answer every two-call fire alarm, and also every water emergency break that may occur. These cars are intended to be speedy, and are on pneumatics. Solids are used on the trucks which do hauling.

Fast Work on a Broken Main

The efficiency of these trucks in this class of service is shown by an instance which happened recently. A 48-in. main broke, and shot a column of water 40 ft. into the air, in fact a veritable geyser, which in an incredibly short time flooded an area of ¼ sq. mile up to the second story windows. In this particular instance the call reached the office at 20 minutes after 12, and the men were on the job at work on the repair in 15 minutes, and in 1 hour and 40 minutes from the time the call came in the main was shut down and the flood stopped. This job with the old methods would have required several hours, and the damage from flooding would have been very much greater owing to the slowness with which men and materials could have been gotten on the job.

Not only is there a saving this way, but the actual cost has been greatly reduced by the introduction of trucks. Before they were put to work, horse wagons were used for the emergencies at two different yards during 24 hours a day, while now a single truck in the same time covers the entire borough. This did away with the second emergency watch which cost $30.50 a day to maintain. It is assumed that this truck alone by having done away with the extra emergency and a big bill for oats which were consumed whether any work was done or not, is saving the department about $25 daily.

Peerless Truck Used by the B. R. T. Company in Its Track Repair Department

Used by the Emergency Switch Repair Track Department

The maximum distance which the vehicles have to cover is about 15 miles on one call. Occassionally the trucks are called to go 30 miles. When asked what they did under these circumstances with horses, it was said that they used to save the horses by calling up one of the subsidiary repair companies in that district, who would send a wagon. Now these companies are no longer bothered.

The Water and Gas Department garages its own vehicles. The garage is now under course of reconstruction, bringing it strictly up-to-date. It accommodates from thirty to thirty-five cars which include the runabouts and touring cars used by officers of the company, foremen of repairs, etc. The drivers of the trucks are laborers, these men having licenses, but work when the job is reached. This cuts down the cost of operation. Nearly all the trucks are fitted with special bodies.

Complete Records Kept

The most accurate records are kept on repair cards and forms, and these records

show an undoubted economy over former methods, so that more trucks will soon be put on in this work.

The drivers of the cars used by the officers are civil service men who receive $1200 a year, and are spoken of as automobile engine men. These men are capable, excellent drivers, and are called upon to work 7 days in the week, in fact have to be ready on call at a moment's notice.

Brooklyn Rapid Transit Trucks

Several motor-driven vehicles are used by the Brooklyn Rapid Transit Company, seven service vehicles being used in the transportation and electric department. Two are electric tower wagons, and there are two trucks for general hauling. One is a four-ton Peerless, the other a three-ton Knox. One of these is employed in distributing tools, and small materials for the surface truck department, and the other in the building department, handling building materials for repair work, such as bricks, cement, etc. Small materials are spoken of as the Rapid Transit Company uses work cars running on their lines for all large, heavy material or for things which must be handled in quantity, the trucks therefore are used on scattered work off the line.

Care of Switches

The automatic switches have to be well attended, and two gas and one electric truck are used in this switch repair work. The electric switches are cared for by a gas car which has been converted from a pleasure car into a semi-commercial car, and carries two repairmen, tools, and materials, as a rule not over 600 lbs. of materials. The other car in this work is a Ford. These average about 40 miles a day, and are valuable on account of the speed with which they can get to the point of trouble.

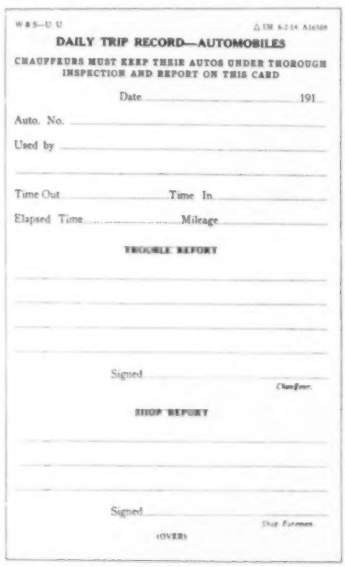
Taking both the cars used by inspectors, officers, etc., and the trucks, about twenty-five vehicles are now in service. The superintendent of lines in the line department has a car, the way and structure department, two cars, one for the superintendent of the surface lines, and runabouts are used by the inspectors. Most of these are Fords, and the statement is made that they cover anywhere from 10,000 to 15,000 miles a year, with very little expense. The inspector at substations is also supplied with a car.

All these vehicles are garaged at 849 Nostrand Avenue, which is the line and truck headquarters, and is very conveniently located.

Each car is required to come in on a certain day and hour for inspection, and special inspectors go over them, to anticipate any trouble. Each month the total operating cost, including tires, shop repairs, oil and gas, etc., is determined for each vehicle, and the result has been that the company says emphatically, "it pays to use motor-driven vehicles."

Brooklyn Union Gas Company Finds Trucks Extremely Helpful

Not only the water companies and railroads, but gas companies as well are making considerable use of motor-driven vehicles. The Brooklyn Union Gas Company, of Brooklyn, N. Y., which controls the Flatbush Gas & Electric Company, is no exception. The first cars were put in service in 1910, the vehicles being many of



DAILY TRIP RECORD—AUTOMOBILES

CHAUFFEURS MUST KEEP THEIR AUTOS UNDER THOROUGH INSPECTION AND REPORT ON THIS CARD

Date ..... 191..

Auto. No. .....

Used by .....

Time Out ..... Time In .....

Elapsed Time ..... Mileage .....

TROUBLE REPORT

Signed .....
Chauffeur.

SHOP REPORT

Signed .....
Shop Foreman.

(OVER)

B. R. T. Daily Trip Report Card

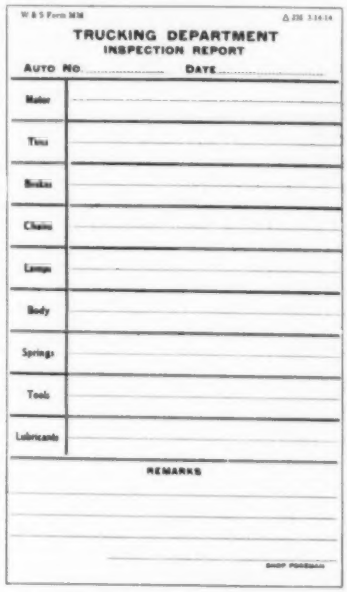
This form is supplied the drivers, who are required to keep accurate records

them pleasure cars used for commercial purposes. These are supplied the superintendents, heads of departments, inspectors, etc. They now are using three Stevens-Duryeas, two Hudsons, two Cadillacs, one Stoddard-Dayton, one Chalmers, four Fords, and four motorcycles.

The company's trouble men who travel in pairs and have a considerable number of small tools, should have some small swift machines, and the company is now looking for suitable vehicles.

A Few of the Cars Used by Officials and Trouble Men of the B. R. T. Co.

The trucking is done with a fleet as follows: an old Knox truck which was the first vehicle to be put in service was converted into an electric, and is still doing



TRUCKING DEPARTMENT
INSPECTION REPORT

AUTO NO. ..... DATE .....

Motor	
Tires	
Brakes	
Chains	
Lamps	
Body	
Springs	
Tools	
Lubricants	

REMARKS

SHOP FOREMAN

B. R. T. Inspection Report

This form is used in the trucking department, and the condition of the machines duly reported on by the shop foreman, at specified intervals, which prevents unexpected breakage on the road, and consequent delays.

work. A GMC truck is employed for looking after the incandescent lamps and the gas and electric appliances.

Novel Winch Arrangement

A new four-ton GMC is about to be delivered, this vehicle having a novel arrangement of winch. Instead of placing the winch on the floor of the car at the rear of the seat where it takes up much floor space, it has been placed about the height of a man's shoulders above the back of the front seat in an accessible position, with cable running over a shieve at the rear. In this position it does not take up useful payload space, and in addition can easily be operated, oiled, and cared for by the driver on the seat. This vehicle is to be used for hauling cables into the subways, for raising poles, etc. One of its chief advantages for this work is that it safeguards the lives of the workmen. The old method was to hoist the pole by means of a large number of men, with boat-hook-like spikes holding the pole upward. If any made a slip the pole was apt to do damage. With this winch and cable the pole is held securely.

The truck is also used in handling the heavy transformers in and out of manholes.

Three Chase trucks are used in the commercial department for hauling supplies, etc. There are two large Packards for hauling materials as well as three large Mack trucks for the general hauling of heavy material, such as pipes, conduits, etc., up to 24 in. in diameter. These are now handled with the same facility that they used to handle 6-in. pipe. A special Packard which is fitted with a tank and pump

for taking back to the plant the condensation and drip of the mains, is also used. This is considerable of a saving and the truck has proven very valuable in this service.

The company finds that small vehicles are very valuable, and that there has been a tendency to use too large trucks. For instance, Mrs. Smith finds that she has to have a new range, and after spending some time in selecting one, she wants it delivered at once. It is impossible to wait until there are several other things going in the same direction to make up a load, as would be done in a department or any other store, and the result is that a large vehicle, the only one available, is sent around with one small stove, which, of course, it not an economical employment of motor-driven vehicles. Smaller units are being installed just to care for such emergency deliveries.

The territory of the company is quite extensive, taking in almost all of Kings County and a large part of Queens County. Deliveries of meters for instance, which used to take all day by horse, are now made in a couple of hours.

The sub-companies cannot afford to keep a stock on hand of large pipe and other things which are used in the business, as they tie up too much capital. Formerly delays were caused because of this lack of stock. Now, however, by means of trucks this material can be gotten so quickly to the point where it is needed that the substations are carrying even less stock than formerly.

Motorcycles for Inspectors, Timekeepers, Etc.

Altogether there are seven motorcycles in use, especially in the outside territory. These are used by the inspectors, timekeepers, etc. Even bicycles are employed, it being found that an ordinary wheel will pay for itself in carfares in 2 months.

The question of garaging developed the fact that a central garage, although it might save expense in garaging all the cars at a single point, would not be as convenient as garages located at several different points near the work, so that the latter has been the method of garaging the cars up to this time.

A STEGEMAN FURNITURE TRUCK

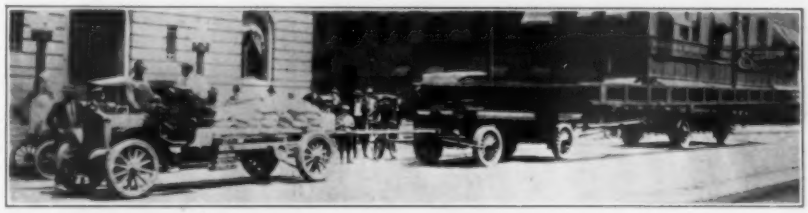
The Kunzelmann-Esser Furniture Company of Milwaukee has a Stegeman one and a half ton special furniture truck which is creating much interest among furniture dealers.

The body of this truck is 12x5 ft. For wet weather the car is equipped with steel bows and tarpaulin. The bow sockets are on the inside of the box leaving the one-piece carved panels clear for lettering and advertising. All metal trimmings and bindings are of highly polished brass, giving the car a very artistic appearance.

Well padded and upholstered side rails and cross rail together with the padded inner side boards, aid in keeping the furniture from being scratched or marred while in transit.

The average load of furniture requires a large amount of space, while its weight rarely exceeds 2500 lbs. The Stegeman Special Furniture Truck meets this condition by having a large symmetrical body mounted on a long wheelbase one and a half ton chassis. This reverses the usual order of truck manufacture where, in order to obtain a large loading area, the purchaser is obliged to choose a larger truck

The long wheelbase (150 in.), extremely moderate semielliptic (54 in.) springs and the use of cushion tires are the main factors that give it its excellent riding qualities.



Federal Hauling Thirty-Ton Steel Girder

This Federal one and a half ton truck, loaded with two and a half tons of cement, attracted considerable attention drawing a thirty-ton steel girder through the business section of Spokane, Wash. The previous day it required eight horses one hour and twenty minutes to haul a similar load, while the truck required only twenty minutes.

Stegeman One and a Half Ton Furniture Truck

In the service of the Kunzelmann-Esser Furniture Company, of Milwaukee, Wis. The body is rather large for the size of the truck, allowing the carriage of bulky loads, which are not necessarily heavy

A Well-Built 'Bus

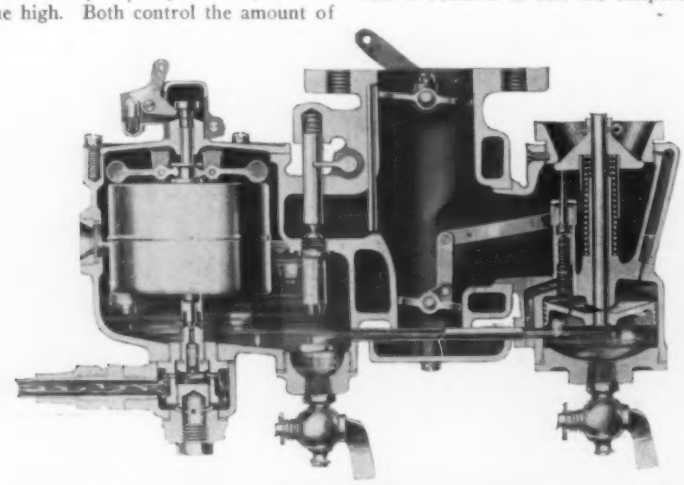
Holds twenty passengers and is used by the Hotel St. George, Santa Cruz, Cal. It is mounted on a Kissel chassis, being built by A. Meister & Sons Company, Sacramento, Cal.

NEW MODEL "G" RAYFIELD CARBURETOR

The Findeisen & Kropf Manufacturing Company, 2100 S. Rockwell Avenue, Chicago, Ill., has brought out a new Rayfield, model G. This new model G Rayfield, which in general appearance is similar to the familiar Rayfield model "C." It is designed especially for handling the lower grade of fuel. The adjustments are practically the same, except that the air valve adjustment has been eliminated entirely. The carburetor is a double jet. One jet supplies all of the gasoline required when the motor is idling, the other being a metering pin which is gradually brought into play as the speed of the motor increases. The body, float chamber construction, and general detail of the carburetor is in accordance with standard Rayfield practice.

The carburetor has three air openings, the constant or fixed air openings, and two automatically controlled valves, which are operated by the suction of the motor. Both valves operate together, and are connected to a piston which operates in a gasoline chamber. This piston prevents the valves from fluttering. It offers resistance to the air valve when the throttle is opened suddenly, thereby giving a strong suction on the nozzles, and effecting an extremely fast getaway. The upper air valve operates the metering pin, which supplies an increasing amount of gasoline in direct proportion to the air admitted. As one of the jets is completely closed when the motor is idling, and the other is under control of the low speed adjustment, this carburetor shows good ability to throttle, and the motor can be throttled indefinitely at an extremely low speed without the slightest tendency to load.

There are only two adjustments, the low and the high. Both control the amount of gasoline and both turn to the right for a richer mixture. These adjustments, while simple and effective, are not sensitive.



Sectional View of New Rayfield Model "G" Carburetor

THE ANDERSON REGULATOR FOR STORAGE BATTERIES

The principal object of this device is to prevent damage to the storage battery from overcharging, either when used in connection with a lighting and starting outfit on the car or when the battery is being charged in the garage.

The Anderson Regulator
Prevents overcharging and damage to battery due to excessive heat

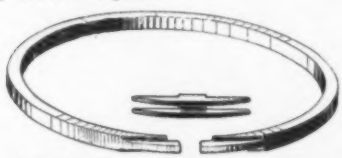
This device controls the charge current entirely by the condition of the battery itself, being operated by the temperature of the battery. It is well known that when a battery is being charged it heats up, and should the temperature rise above 100 degrees F. and the charge rate not cut down the battery will be seriously damaged.

By means of this regulator the charging rate is reduced to suit the temperature of the battery. It also watches the solution or electrolyte, as in case of a battery being partially dry due to evaporation or leakage, it warms up in direct proportion as the solution is low and the current is reduced and kept so until the solution has been brought up to the proper level and the battery is in condition to receive the charge.

The device is inserted through a hole in the top of the battery cover, preferably the vent hole. One wire is run from it to the field coils of the dynamo, while the other is connected to one of the battery terminals. As the temperature rises the circuit is closed and the field strength reduced as long as the temperature of the battery is high. This device lists at $3.50 and is made by the Economy Electric Company, Economy, Pa.

THE BURD HIGH-COMPRESSION PISTON RINGS

Everyone knows the disadvantages of losses occasioned by piston rings leaking. Among them are loss of power on account of the piston not drawing in a full charge of gas, and the gas getting past the cylinder into the crank case; lack of lubrication and excessive carbon deposit, necessitating "grinding" of valves, caused by the oil passing above the piston.



Burd High-Compression Piston Rings Relaxed and Coupler Detached, Ready to Spring Over the Piston

A device to prevent this is being marketed by R. L. Burd, Rockford, Ill., in the shape of the Burd high compression piston ring. These rings are of one thickness all the way around and exert an equal pressure against the cylinder wall at every point. They are made of a special mixture to withstand heat and will glaze to a glass-like smoothness, when they will run almost indefinitely with little wear to themselves or the cylinders. By springing the ring open slightly, the coupler lifts out and the ring is ready to spring over the piston. The coupler is then placed into the ring before replacing the cylinder, when both the ring and coupler lock together. As an equal pressure is presented to the cylinder wall, no oblong cylinders will come from their use. As a single ring it can be ground accurately to perfectly fit the ring grooves. The coupler seals the opening to the passing of oil or gas as well as sealing the opening to the passing of oil or carbon into the air space between the ring and the piston.

COMPLETE GENERATING AND DECARBONIZING OUTFIT

The accompanying illustration shows a complete generating and decarbonizing outfit, made by the Oxygen Generator Company, Inc., 304 River Street, Troy, N. Y. The apparatus is well made and efficient, and its operating cost per cylinder is but $.14. As a garage proposition it is well worth while, and at the same time its low cost

"Oxygas" Generating and Decarbonizing Outfit

This apparatus generates its own oxygen, and by placing a four-pound can of "Oxygas" in the generator, enough oxygen can be generated in three to four minutes to clean four very dirty cylinders.

puts it within the reach of the individual owner. A stop cock prevents the oxygen from escaping while not in use. The complete outfit, with enough chemicals to clean eighteen cylinders, costs $15. The recharge is called "Oxygas" and is sold in 4-lb. tin containers at the rate of $.83 1/3 each when bought in lots of six. Each can furnishes enough oxygen to clean six cylinders; a proportional amount is used for a different number of cylinders. The outfit is about 2½ ft. high.

SHELDON THREE-TON WORM-GEAR AXLE

The Sheldon Axle Company, Wilkes-Barre, Pa., is now shipping three-ton worm-gear axles in large quantities to many of the prominent truck builders. This axle follows the same general design as previous models. The worm is made of special heat-treated steel and ground. The worm wheel is cut from special formula bronze. Both the worm and wheel are finished on special machinery. The worm and worm wheel is carried in a worm carrier—a very substantial casting machined by special jigs and fixtures to receive the worm and worm wheel in perfect alignment. The methods employed in machining the worm carrier insures positive adjustment at all times and renders the assembly unit absolutely "fool-proof."

Ball bearings are used throughout. The top of the worm gear carrier is drilled and tapped for an eye bolt to facilitate the removal of this unit, which contains the worm, worm wheel, radial bearings, thrust bearings, and differential bearings. The differential thrust bearings are mounted in the axle housing proper. All differential gears and pinions are 3½ per cent. nickel steel, heat-treated. The differential spider is drop-forged and 3½ per cent. nickel steel, heat-treated and ground to size. The axle shafts are 3½ per cent. nickel steel, heat-treated, and accurately proportioned, insuring uniform stresses throughout.

Special attention has been given the subject of brakes on this axle with the idea of securing the proper brake area, and at the same time using 36-in. diameter wheels and securing proper clearance between the brake parts and the skid chains. The axle is equipped with 20-in. brake drums and has four 2½-in. wide internal brakes. This design gives ample brake area, and at the same time permits the use of 36-in. wheels with anti-skid chains, without interfering with any of the brake parts. This design also has the added advantage of protecting the brake drum and lining from mud and dirt.

No provision is made for radius or torsion rods, braking the driving torque being taken through the springs.

THE LINQUIST AUTOMATIC FENDER AND BRAKE

The feature of the Linquist device lies in the fact that it performs a threefold duty—first, acting as a fender; second, putting on the brake, and third, stopping the engine. This automatic feature makes this fender extremely valuable, because it takes care of the duties of the operator automatically should the latter become bewildered. Any object coming in contact with the fender automatically lowers the fender, sets the brakes and stops the motor. The same operations can be performed before striking any object by releasing a foot trip lever.

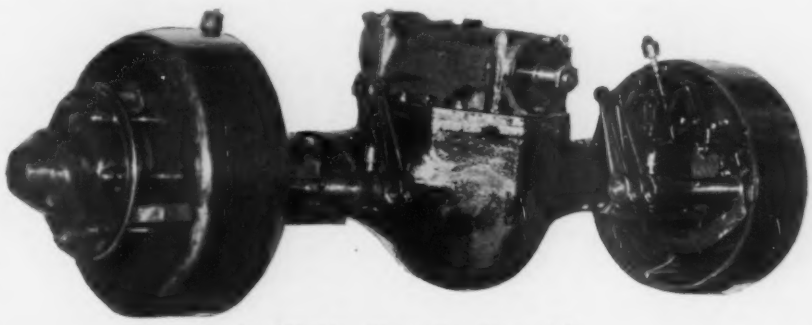
The Linquist fender works in a downward perpendicular direction and is always in readiness. It can be lowered to within one-half inch from the ground or to any desired height. All parts are interchangeable and adjustable to fit any make of truck. It extends only 13 inches in front of the machine and takes up no more room than a regular bumper bar. This fender is manufactured by William A. Linquist, 901-

The Linquist Automatic Fender Brake In Raised Position

903 Marquette Avenue, Minneapolis, Minn. This party also manufactures an anti-skid device which prevents a car from swaying or skidding. It is fastened and braced at any desirable point near the rear of the car and is brought into instant operation by pulling a cable.

The Simmons Tire

The cylindrical rubber blocks are held in place by steel forgings. After the rubber shows wear, the bolts holding forgings are loosened, and the cylindrical blocks turned, giving a new wearing surface. These cylindrical blocks can be turned at least six times, each time the tire becomes practically a new one. It is marketed by the Modern Railway Appliances Company, 981-983-985 Broadway, Albany, N. Y.



New Sheldon Three-Ton Worm Axle

Motor Trucks of Southern California Edison Company

With Complete Set of Record Forms Used at the Company's Main Garage and Repair Shop

By FRANK REED

Sixty commercial cars and one hundred pleasure vehicles are owned and operated by the Southern California Edison Company in connection with its operations in Los Angeles and other Southern California cities as far north as Santa Barbara and southeast to Redlands. The main garage and repair shop is located at Los Angeles, and there are fourteen other garages at outside points.

The automobiles are all under the general supervision of E. E. Hendricks, General Foreman of Automobiles, whose office is at the main garage in Los Angeles.

Of the commercial vehicles, fifteen are electric 1000-, 1500-, 2000-lb. vehicles, with one 3000-lb. and 2 tons as the highest capacity. The electric fleet includes trucks of several leading makes. The balance of the trucks are gas cars of various makes and capacities. The makes that are represented among the gas cars are Gramm, Autocar, Moore, Moreland (the latter two being locally manufactured), Alco, Pierce Arrow and Willys Utility. The electrics are used almost entirely in "service work," and particularly in work that is close in, so that the full economy of the electrics under the special conditions which are most favorable to them and hardest on gas car costs are realized. Four electrics are operated at Santa Monica, two at Pamona, some at Long Beach, where city conditions are realized as at Los Angeles. Some of the electrics at Los Angeles are assigned to underground construction, two one-ton and one two-ton machines are used for hauling cable, outfit, etc., and also for pulling cable into the underground conduits.

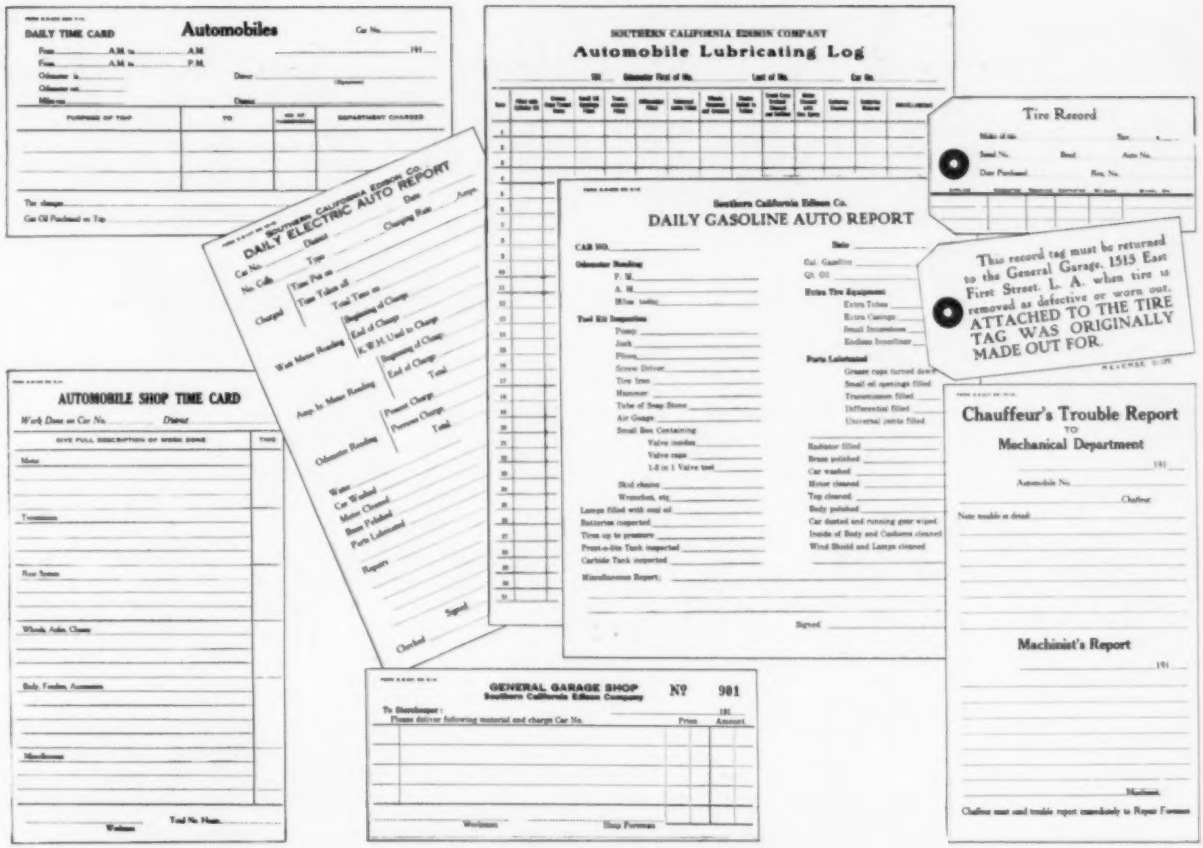
Gasoline trucks are used for long haul work; three are used regularly by the engineering department, three in general warehouse and store work distributing supplies. Most of the company's freighting from headquarters to outside points, etc., is done by trucks. The balance of the gasoline trucks are used principally in service work, and especially at outside points. They are only loaded to capacity part of the time. The company cannot arrange to give them a capacity load constantly as can be done usually in commercial or contract work. There are times when the trucks

SHOP REPAIR CARD DATE BEGUN _____ FINISHED _____ CAR NO. _____

Check Work Wanted	WORK WANTED	Check When Done	Workman's No.	Check Work Wanted	WORK WANTED	Check When Done	Workman's No.	Check Work Wanted	WORK WANTED	Check When Done	Workman's No.	Check Work Wanted	WORK WANTED	Check When Done	Workman's No.
	Radiator.				Renew points, reline				Stop grease leakage				Spring Clips—tighten, renew		
	Repair, clean, paint				Oil—adjust, repair, renew				Fill with grease, oil				Grease Cups—renew		
	Take off				Rewire to motor, to battery				**Shifting Device.**				**Fenders.**		
	Starting Crank.				Dry Cells—test, renew				Oil, tighten				Repair, paint, enamel		
	Repair, renew, line up				Battery—test, recharge, fit				Make lever stay in neutral				Stop rattle		
	Front Axle.				**Spark Plugs—clean, renew, repair**				Lever don't stay in				**Body and Accessories.**		
	Straighten				New terminals				Take out lost motion				Tighten, repair, stop squeak		
	Renew bushings				**Gasoline System.**				**Drive System.**				Floor Boards—repair, renew		
	Wheels—repair, line up				Gasoline Tank—clean, repair				Universals—repair, grease				Heel Board—Repair, renew		
	Wheels—grease, adjust				Gasoline Pipe—Crush, Repair, Renew				Drive Shaft—repair, straighten				Cushions—repair		
	Wheel Hubs—true up, renew				Carburetor—clean, adjust, repair				Torsion Tube—repair, tighten, straighten				Moulings—renew, refinish		
	Hub Bolts—tighten, renew				Hand Pump—repair, clean				Torsion Tube Bracket—tighten, repair				Top—repair, renover, fit curtains		
	Wheels—renew bearings				**Spark Control.**				Take out all back lash				New Curtains, new celluloid		
	Motor				Adjust, tighten				**Rear Axle.**				Doors—repair, stop rattle		
	Clean, paint				Renew ball and socket joints				Pinion Shaft—adjust				Locks—repair, renew, oil		
	Heats				**Throttle Control.**				Differential—adjust, grease				Wind Shield—repair, tighten		
	Fan Stud—repair				Adjust, tighten				Differential—repair				Wind Shield Rods—tighten		
	Fan—adjust, repair, renew				Renew ball and socket joints				Drive Axle—renew, right, left				Dash—stop squeak, repair		
	Fan Belt—tighten, renew				Foot Throttle—adjust, repair				Wheels—grease, adjust, repair				Hood—repair, refit, varnish		
	Fan Pulley—renew, line up				Throttle down motor				Wheels—stop leakage, renew				renew fasteners		
	Carbon—scrape				**Muffler.**				Wheels—renew bearings				Horn—repair, new reed, new bulb		
	Valves—Grind, adjust, renew				Repair, tighten, clean				Wheel Hubs—renew, repair				Speedometer—repair, adjust		
	Push Rods—adjust, renew, quiet				Repair, cutout				Driving Dogs—renew, repair				Clock—repair, put on		
	Push Rod Guides—repair, renew				**Pan.**				Housing—straighten, repair				Lamps—repair, renew,		
	Bearings—tighten, scrape, renew				Tighten, clean, straighten				Take out back lash				connect—bulbs, tips		
	Chains—adjust, renew				**Steering Gear.**				**Brakes.**				**Seat Covers—repair, clean, put on**		
	Valve Caps—tighten, renew				Overhaul				Emergency—adjust, reline				Robe Rail—Repair, put on		
	Oil Base—new gasket, tighten				Take out rattle, tighten wheel				Foot—adjust, reline				Foot Rail—repair, put on		
	Cylinders—renew, clean, repair				Tighten adjusting nut				Take play out of rods				Top Irons—repair, renew		
	Pistons—renew				Take out play in rods				Stop rattle in pedal				**Miscellaneous.**		
	Piston Rings—fit, renew				Take out play in knuckles				Stop rattle in rigging				Paint, varnish		
	Replace motor				Loosen steering gear				Foot Lever—repair				Touch up and varnish		
	Straighten Crank Shaft				Oil and grease steering gear				Hand Lever—repair				Wash, polish car		
	Renew Crank Shaft				**Clutch.**				Oil rods, levers, arms				Fill with gas and oil		
	Stop oil leak				Stop slipping, spinning				Oil cross-over shaft				Tires—repair, pump		
	Cylinder Bolts—tighten, renew				Stop grabbing, adjust pedal				**Frame.**				Rims—tighten, repair, replace		
	Engine Bolts—tighten, renew				Stop rattle in pedal				Straighten, patch, rivet				Number—put on, repair		
	Oiling System.				Leather—oil, clean, oil hub				Foot Boards—renew, recover				Tow in car from		
	Oil Pump—repair, clean				Ball Race—renew, repair				Foot Boards—renew moulding				Repair car at		
	Oiler—adjust, repair, pack				Take play out of cross shaft				**Shock Absorbers.**				New grease cups		
	Oiler Pipes—repair, renew				**Self-Starter.**				Repair, adjust, oil				New Oil Cups		
	Water System.				Repair, rewire, grease				Put on, take off				Put on gear lever lock		
	Stop leaks				Tighten clutch				**Toggle.**				Oil—side and tail lights		
	Renew hose				**Transmission.**				Renew, repair				Presto—recharge		
	Water Pump—repair, pack				Clean, overhaul				Grease, new boot				Rims—Demountable—put on, tighten		
	Ignition System.				Gears—space, renew, touch up				**Springs.**				Test out		
	Overhaul				Bearings—tighten, renew				Renew, repair, reset						
	Magnet—clean, adjust, repair				Bolts—tighten, renew				Spring Bolts—oil, renew						

MISCELLANEOUS

Shop Repair Card Used by Southern California Edison Company



Forms Used by Southern California Edison Company

carry full load, but stand idle for the best part of the day, and then bring back part of the load they have taken out. The need of a heavy truck is not established by any consideration that can be stated on a ton-mile basis, but rather that from time to time working conditions demand the capacity, and that these conditions occur sufficiently often to justify the purchase of the heavy truck, even though its capacity is not fully used all the time.

Close supervision is exercised to hold the loading of the trucks down to rated capacity and to moderate speed. This is put up to the drivers and checked by the traveling automobile foreman and the company's officials who have frequent opportunities to observe the cars in service and keep this point in mind. No lock meters of any kind are used, but reliance is placed on the drivers carrying out the policy, and experience shows that they cannot do otherwise long without detection. The traveling automobile foreman checks up the condition of the cars and sees that repairs are made promptly so as not to develop aggravated troubles. In further development of this policy, night forces of one to three mechanics are kept in the outside garages and two in the Los Angeles garage. These men see to it that all minor repairs and adjustments are properly made each night, so that trucks go out in good condition in the morning. They are also able to check conditions requiring shop repairs and see that they are made promptly when the work can be done at minimum expense.

The electric trucks receive charging service at two garages, the main and one in another quarter of the city. All repair work is done in the Los Angeles garage repair shop. Here are taken care of the repairs of both the pleasure and commercial vehicles. One carpenter is kept busy all the time on body work, doing not only repairs, but construction of tool boxes, etc., for commercial vehicles, and most of the special body building which is required from time to time.

A Body Which Provides for an Overhanging Load

Overhanging loads, which are characteristic of hauling in the fruit and produce business, are arranged in a novel manner in the one and a half ton truck owned by Tony Lamantia, of Chicago. The body of this truck is built with steel straps between the flareboard and the top. These straps bulge out considerably, permitting the owner to take advantage of all the loading space provided by the platform of the truck and to load outside the limits of the flareboards without the necessity of roping the entire load.

The Whitwood One and a Half Ton Truck

THIS medium capacity machine comes from a new entrant into the commercial-car industry, the Whitwood Corporation, of Weedsport, N. Y. It has a four-cylinder motor under the hood, transmission in unit with jack shaft, chain drive, and 130-in. wheelbase.

Bodies

On this chassis is given an option of two bodies—a standard stake and an express type. The stake job is 44 in. wide and 108 in. long, inside of stakes. The platform is 11¾ in. wider than the driver's seat, giving a space of 5⅞ in. on each side of the seat, permitting long material to project forward beyond the front of the loading platform when necessary. This body is also furnished with a wide platform, extending over the rear wheels, these platforms being 60 in. wide and 108 in. long. When required, a draw-head for trailers can be furnished. The express body, which can be changed to the platform, or vice versa, by one man in five minutes, is 40 in. wide and 108 in. long. Side boards are made 12 or 15 in., as preferred, flare boards 6 in. This body is provided with hinged or lift-tail gate and has two narrow-hinged doors, one at each front corner at side of seat riser, which can be opened to allow loading of long material so as to project forward at either or both sides of seat riser.

Besides these principal types, various other styles are furnished, as will be seen under the heading "Prices."

The Motor

The motor is of four-cylinder, four-cycle type, 3¾-in. bore, 5-in. stroke. Cylinders are cast en bloc, of the finest quality of close-grained gray iron. Cylinders and valve passages are entirely water jacketed. Pistons are made of the same quality of iron as the cylinders and are slightly tapered. Connecting rods are of I-beam section, drop forged, of 35 per cent. carbon steel. Crank shafts are large and strong, made of 40 per cent. carbon steel. Cam shafts are made of 40 per cent. carbon steel and run in large bronze bearings, the cams being forged integral with the shafts. Push rods are of the mushroom type, made of nickel steel and case hardened. The crank cases are made in two pieces, of aluminum casting. All gears are encased in an oil-tight compartment at one end of the crank case and by taking off the end plate of case the gears and cam shaft can be removed.

Lubrication

The lower half of the crank case has an oil reservoir and the oil is distributed by means of a pump located on the outside of the crank case, the pump being gear driven from the cam shaft. The oil is forced into a main duct, cast integral with the crank case, from there distributed through smaller ducts to the main bearings, thence, through a hollow crank shaft to the connecting rod bearings, and thus a constant stream of oil is forced through each bearing. A fine wire gauze is brazed to the inlet of the oil pump to prevent grit or sand from getting into the bearings. A sufficient amount of oil is thrown off by the connecting rods to thoroughly oil the pistons and cam shafts, both of which are provided with oil pockets.

An oil gauge on the crank case indicates by means of a ball and float the exact amount of oil contained in the reservoir.

A feature of this lubrication system is the Woodworth lubricant-operated cutout, a device which positively and automatically stops the motor in case of insufficient lubricant in the crank case reservoir. This device acts before any damage to the motor can occur by reason of lack of proper lubrication and the motor cannot be started until the requisite amount of lubricating oil has been put in the crank case reservoir.

Whitwood One and a Half Ton Truck With Express Body
One of the many types furnished on this chassis, which lists at $1400, with bodies extra

Cooling and Ignition

Water circulation is effected by means of a thermo-syphon arrangement. Both the upper and lower hose connections are of large dimensions and offer a direct route for circulation of the water. The radiator is of the tubular type, extra heavy construction and is mounted on the sub-frame to obtain freedom from distortion. The fan is of steel, is supported on an adjustable bracket, has ball bearings lubricated by a grease cup and is driven by a belt from the magneto shaft.

Ignition is provided by a Bosch magneto, which is geared direct to the cam shaft and turns at motor speed.

The wires used in connecting with the magneto are all encased in metal conduit and well protected from mechanical injury.

A governor, which cuts off the ignition when a speed of 15 m.p.h. is exceeded, is fitted. This governor does not prevent the operator from rushing bad hills and in no way interferes with the delivery of maximum power by the motor at any time and instantly.

The motor is mounted on a sub-frame, which is attached to the main frame by a three-point suspension, the front point being a trunnion suspension and the two rear side points being attached to a heavy steel cross member, which, in turn, is riveted to the main frame. This relieves the motor and supporting arms from any strain caused by distortion of the main frame when the truck is passing over uneven surfaces and permits of removal of the motor from the chassis very easily and quickly.

Clutch and Drive

The clutch is an aluminum cone, with leather face engaging with the fly-wheel. It is placed in an accessible position, where it may be easily removed, there being no cross members, shafts or rods to interfere with its removal.

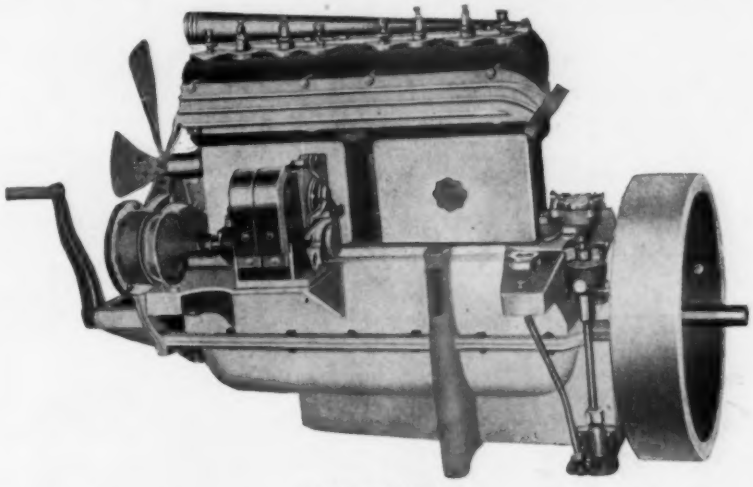
Drive is transmitted through block and trunnion universal joints and a heavy propeller shaft to a transmission, which affords three speeds ahead and reverse. Shafts

run in high grade, annular ball bearings. The transmission case is rugged as well as being light in weight and is bolted direct to the jack shaft, thereby forming a solid unit. The drive is transmitted from the jack shaft to the rear wheel sprockets by means of roller chains.

By the use of large-sized sprockets on both the jack shaft and rear wheels, the angular motion between pins and bushings as to give flexibility and at the same time afford sufficient strength to carry all intended loads and withstand strains.

The steering gear is on the left side and is attached to the main frame in such a manner that the whole unit can be detached without disarranging other parts.

The gasolene tank is carried under the driver's seat, with filler pipe projecting through the side of the driver's seat.



Whitwood Motor

Four cylinders, 3¾ x 5 in.; Bosch magneto and Schebler carburetor. Features a device which stops the motor when lubricant supply is insufficient

in the chains is reduced, thus adding to the life of the chains and at the same time diminishing noise, friction and tensile strain.

Axles, Wheels and Brakes

The axles are solid steel forgings. The front has an I-beam cross section 1⅞x3 in.; the spindles are 2 in. in diameter; the steering knuckles swing on heavy king pins and the thrust load is carried on ball bearings located in the top of the knuckle. The rear axle has an I-beam cross section 1⅞x3 in., with 2-in. spindles.

The rear axle is held in alignment by radius rods of large size and great strength, which are firmly connected to the jack shaft. These radius rods also take care of the emergency brake reaction and on account of their great strength insure a positive braking system.

Wheels are artillery type, of second-growth hickory, fourteen 2-in. spokes in each wheel. They turn on large Bower roller bearings. Regular equipment of Goodyear solid rubber tires, 2½-in. clincher type in front, and 3½-in. demountable in rear.

There are two separate braking systems. The emergency brakes are controlled by a hand lever and act directly on 14-in. drums on the rear wheels. The service brake is controlled by a pedal and acts on 10-in. drums on both ends of the jack shaft.

Springs, Frame and Other Details

Springs are semi-elliptic, with the rear supplemented by an auxiliary cross spring, which comes into play only under load.

Frames are built of steel channels, gusseted and cross braced in such a manner

Prices

The chassis and driver's seat are catalogued at $1400, finished. Cab top, with storm curtains, is $35 extra; express body, $65; stakes and chains to convert express body to stake type, $35; regular stake body, $75; sides and end boards to convert it to express type, $25; non-convertible express type, $50; same with canopy top, $90; same type body, but platform 58 in. wide, $65; this body, with canopy top, $110; non-convertible stake body, with 60-in. wide platform, $90; combination express and omnibus body, $125, without cushions; hotel omnibus body, for fourteen persons, $600; express or mail body, with screen sides, $125; this body with platform, 60-in. wide, $140.

Correction: In our September issue, on page 29, we stated that the rear tires on the Cass Model E truck were 36x4. This size should be 36x5 in.

KLEIBER TRUCKS IN THREE CAPACITIES

These machines are built by a newcomer in the motor-truck industry—Kleiber & Company, Incorporated, 1424-40 Folsom Street, San Francisco, Cal. They are built of standard parts, such as Continental motor, Ross steering gear, Brown-Lipe transmission, etc., and are produced in three capacities—1½, 2½ and 3½ tons. All follow the same general construction, differing only in having heavier members where necessary.

The One and a Half Ton Model

This offering is driven by a 35 h.p., four-cylinder, en bloc Continental motor, fitted with Bosch magneto, Schebler carburetor and heavy truck type radiator.

The transmission is a 50-h.p. Brown-Lipe, three speeds forward and reverse. The jack shaft has 12-in. service brakes on its ends. The rear axle is hand forged, 1¾x3 in., and fitted with roller bearings. The I-beam front axle also carries roller bearings. Wheels are 36 in. with fourteen 2½-in. spokes and S. A. E. bands for demountable tires, which are 36x3½ in. in front and 36x5 in. in the rear. The rear wheels carry the 2¾x16 in. expanding emergency brakes.

Front springs are 44x2½ in. chrome vanadium, while the rear are 54 x 2½ in. Frame is hot-riveted channel section, 9 lbs. to the foot. Steering gear is a Ross with hardened and ground wearing parts.

Wheelbase is 150 in., length of standard body back of seat 11 ft., gasoline capacity 23 gal. and price $2250 f.o.b.

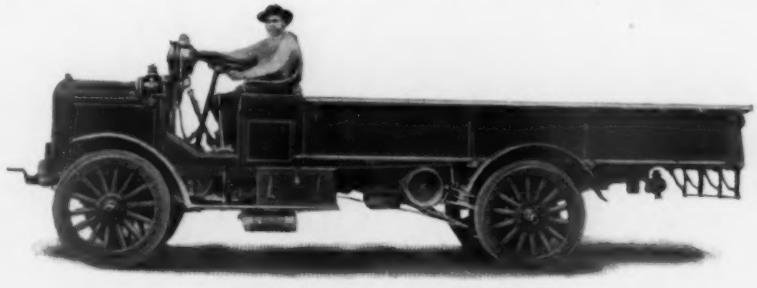
The Two and a Half Ton Model

If differs from the foregoing in having a 40-h.p. motor, 2x3⅜ in. rear axle, 36x 4 in. front and 36x3½ in. dual rear tires, 11 lbs. to the foot in the frame, length of standard body back of seat 12 ft., and the price of $2750.

The Three and a Half Ton Model

The differences between this and the second model are the use of a 50 h.p. motor, a 60-h.p. transmission, 2¼x3⅝ in. rear axle, 3½x18 in. emergency brakes, 3 in. spokes in the wheels, 36x5 in. front tires and 36x5 in. dual rear, 46x3 and 54x3 in. springs, wheelbase 160 in., length of standard body back of seat 14 ft., and price $3300.

The company is equipped to furnish special bodies for any requirements.



Kleiber One and a Half Ton Truck

Composed of standard parts; 150 in. wheelbase. Price, $2250, with standard body. The other models have the same general appearance

The Bingham 1250 lb. Light Delivery Truck $800 Complete

RESPONSIVE to the increasing demand for an all around, general purpose truck, that will handle the loads in everyday business of the department store, the grocer, the hardware dealer, the plumber, the contractor, the farmer and the general merchant, where a light load can be delivered with economy and dispatch and a full load with safety, the Bingham Manufacturing Company, of West Park, Cleveland, Ohio, is manufacturing a light delivery truck of 1250-lbs. capacity, retailing at $800, complete with body.

Herbert Bingham, the designer of the Bingham Light Delivery Truck, is not a novice in the truck business either from the manufacturing or the selling end, and the Bingham Light Delivery Truck is the result of his experience covering a period ever since R. E. Olds turned out the first single cylinder 4 h.p. runabout, equipped with delivery body.

Common sense and a pencil will prove that far away the largest percentage of consumers of smaller trucks are the owners of horse-drawn vehicles, who desire to replace one, two or three rigs. The ordinances passed by the police and other authorities prohibit the stabling of horses in or around neighborhoods chiefly occupied by dwellings.

The average merchant cannot afford the time to stable his horses away from his place of business, as goods have to be delivered when the costumers call for them, and as these demands are getting more and more stringent every day, the time will come when all merchants making deliveries will have to do so by motor-driven vehicle.

In catering to the demand for a light delivery truck, Mr. Bingham took into account these very important features—simplicity, loading space, pay load, horsepower and wheelbase.

Commencing at the motor, we find that the cooling by the thermo syphon system, avoiding the necessity of a pump to circulate the water. A large radiator is provided to effect the cooling in a satisfactory way in the hottest weather under the most strenuous conditions. The Eisemann magneto provides the spark, no spark control lever, however, being found, a set spark being provided.

In a friction-driven transmission, as is applied in the Bingham Light Delivery Truck, the fiber filler used on the drive wheel is the only part that can wear. This can be replaced for a few dollars at any time by anyone capable of handling a wrench. It will last from 5000 to 10,000 miles, so that an expenditure of a few dollars will continue to keep the car in operation with the positive knowledge that nothing will wear out.

The front and rear axle and spring equipment are made by the Liggett Spring and Axle Company. The front axle is of I-beam section and is equipped with Bower bearings, on which the front wheels run. The rear axle is equipped with Hyatt bearings and Cullman self-contained differential with hardened spur gears.

The shaft carrying the drive wheel is 32 in. long and 2¼ in. diameter and made from special steel, heat treated and toughened. This shaft revolves in Hyatt bearings on steel housings and is lubricated by grease cups easily accessible. From the jack shaft to the rear differential the power is transmitted by means of imported Coventry chain.

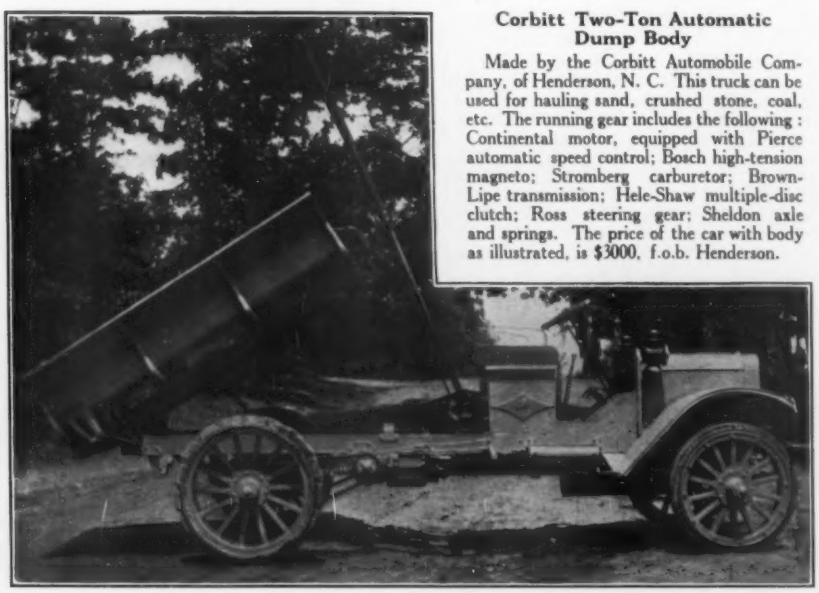
The wheels are equipped with Goodrich demountable rims so that the changing of tires is effected in a few minutes. The Bingham Light Delivery Truck is equipped complete in every detail and is supplied with either panel, stake or open express bodies. These bodies, as will be seen from the illustration, are extremely roomy, having a loading space of 78 in. behind the driver's seat, 42 in. wide and 52½ in. high. The panel job is equipped with either doors, end gate at bottom or end gate at bottom and top, as may be required.

The motor is 3½-in. bore and 5-in. stroke, and is made by the Continental Motor Manufacturing Company. It is of the four-cylinder, L-head type, with the cylinders cast en bloc. Pressed steel frame 3/16 in. thickness, 115-in. wheelbase, Lavigne steering gear, Goodrich tires, demountable rims and wheels, ventilating windshield, full-tool equipment, lamps and horn complete with body. This very up-to-date truck sells at $800.

It will be noted that all models are equipped with doors to the driver's seat, so that it forms an excellent car for winter or summer use.

The Bingham Light Delivery Car

A new car brought out by the Bingham Manufacturing Company, of West Park, Cleveland, Ohio. The capacity is 1250 lbs. and the price is $800, complete



Corbitt Two-Ton Automatic Dump Body

Made by the Corbitt Automobile Company, of Henderson, N. C. This truck can be used for hauling sand, crushed stone, coal, etc. The running gear includes the following: Continental motor, equipped with Pierce automatic speed control; Bosch high-tension magneto; Stromberg carburetor; Brown-Lipe transmission; Hele-Shaw multiple-disc clutch; Ross steering gear; Sheldon axle and springs. The price of the car with body as illustrated, is $3000, f.o.b. Henderson.

Europe's War One of Motor Cars

Importance of the Motor for Offensive and Transport

By OUR FOREIGN CORRESPONDENT

THOUGH all students of the stupendous European struggle are agreed on the importance of the automobile in the present war (some indeed going even so far as to call it a motor war), little, if any, attempt has been made to analyze the exact position filled by the car, or to estimate the scope and value of its work.

At the present stage it is impossible to know definitely the exact details of motor transport in the armies of each country, and it is improbable that such details will be known, at least until after the war. It is, however, possible to form a fairly correct relative idea as to the amount of motor transport being utilized by most of the leading nations in the present struggle.

The Combatants' Automobile Resources

Official returns in Germany showed that on the first day of this year, the total number of automobiles in that country amounted to 93,072 made up of 60,876 cars of all sorts—private and otherwise—for passenger carrying; 9639 automobiles for freight transport; 22,457 motorcycles for passengers; and one hundred such machines for freight carrying. There is reason to think that all available motor cycles—and indeed more—are in use, for several tourists who have come through Germany have returned minus their machines, which had been commandeered by the "mailed fist." In analyzing the 70,515 cars—as distinct from motor cycles—it is desirable to remember that of late there has been a steady tendency towards higher powered engines, and therefore the power statistics may give some indication of the proportion of effectives to obsolete. Of the 60,876 cars, 15,188 (approximately 25 per cent. were of 8 h.p. or under; 17,735 (about 29 per cent.) ranged from 8 to 16 h.p.; 25,734 (about 42½ per cent.) were above 16 up to 40 h.p.; 2219 (3½ per cent.) were over 40 h.p. Among the commercial cars, 2019 (almost 21 per cent.) were merely small vans or carriers of 8 h.p. or under; the power of 2259 (24 per cent.) between 8 and 16 h.p.; 4549 (47 per cent.) from 16 to 40 h.p.; 812 (8 per cent.) were of over 40 h.p. Taking into consideration how great the pressure of the Allies has been on Germany, there is reason to think that at least 60 per cent. of the passenger cars and 70 per cent. of the others have been utilized in one form or another. This would give Germany roughly speaking about 40,000 passenger-carrying cars and nearly 7000 trucks of various sizes.

Austria is credited with something more than 11,000 cars for private use, 800 commercial trucks, and 3,000 motor bicycles; but since the recurring series of disasters sustained by the Dual Monarchy at the hands of Servia and Russia, it is reported that disorganization has been such as to detract enormously from the value of such transport.

Turning to France we have no statistics later than the beginning of 1913, when the total number of automobiles registered in France numbered 90,959. The previous two years' progress, however, gives a sufficient clue to arrive at a fairly accurate approximation for the present day, and we may safely estimate the number as possibly 105,000 automobiles of all sorts. Of the French total it is stated that some 70,000 are being utilized—a figure which would correspond fairly closely with that of the Germans, and of these it is estimated that at least 18,000 are commercial cars, the larger sizes of trucks bearing a much greater proportion to the whole than is the case in Great Britain.

Russia, which practically does not manufacture for herself, affords but little clue beyond her imports, and these do not show very up-to-date figures, but ever since 1909, the import figures have risen rapidly, and moreover, the Russian government has of late been buying up heavy transport vehicles at a great rate, with a view to such a possible contingency as this war.

Neither is Belgium to be neglected with her 9500 cars for private use, 450 commercial trucks, and 3750 motor cycles, though by now many have fallen into the hands of the Germans.

In the United Kingdom no statistics are published, but the writer has reason to know that in round numbers Great Britain owns about 220,000 cars for private use, 18,000 commercial, and 175,000 motor bicycles. As far as the British requirements are concerned, as was stated some months ago in *The Commercial Car Journal*, one thousand cars of one and a half and three-ton load capacities (chiefly the latter) were considered sufficient for the needs of the modest British Expeditionary Force of about 125,000 men. These in course of time would all have been of approved subsidy pattern, but the sudden coming of war easily anticipated a development that could only come about by gradual evolution, and as a result a very miscellaneous lot of machines was requisitioned for service, besides the already subsidized vehicles.

Standardized Speed

Yet on the whole this assorted force of motors has acquitted itself distinctly well. Judging by experience gained so far, the importance of standardization has not proved of so much importance as was expected, though standardization of speed—that is to say, of using together vehicles of the same speed capacities—has been emphasized.

Broad Lines of Organization

The partial transition from horse to motor has already brought about considerable modifications in military transport, a good example of which is afforded by the methods in use in the British army. Under the old classification transport was divided into three main branches: first, second and third line transport, as follows:

First Line Transport.—(a) Carts and wagons for rifle and machine gun ammunition, pack mules for rifle ammunition and tools, animals for machine guns, carts for tools and medical stores; (b) technical transport of artillery and engineers, and the ambulances and water carts of the medical corps.

Second Line Transport.—(a) The vehicles and animals conveying the stores, baggage, and regimental supplies of all units of the fighting troops, and regimental water carts, *i. e.*, carrying all those things not required in action; (b) the artillery ammunition columns, carrying reserves of rifles as well as gun ammunition, and moving immediately in rear of the troops—in other words, at the head of the second line; (c) the horsed wagons, etc., of the transport and supply columns.

Third Line Transport.—Ammunition and supply packs, maintaining connection between advanced depots or rail-head and the second line columns.

But the increased use of the automobile the motor trucks now run direct from the advance bases or rail-head to within 5 miles of the fighting line if possible, at which point they supply the ammunition columns, and the regimental supply wagons of the old second line.

Over Fifty Per Cent Saving in Numbers

In the reign of the horse, fifty-four service horse wagons were allotted to each division, and each of these was capable of carrying 3000 lbs. It is now considered that the place of these fifty-four wagons can easily be taken by twenty-four motor trucks.

For our own purposes of broad consideration, however, the automobile for warfare may be classified as (.) for offensive purposes; (2) for transport.

The Automobile for Fighting

The first class resolves itself into little else beyond the armoured car, nearly invariably mounting a quick firing gun, and the success of these machines has certainly been most remarkable. A difficulty resulting from their use is the time required to turn the car, especially in a narrow road and when under fire. This matter of turning around is one of some importance in military reconnaisance work, and it is quite possible that before long we may see fast "either way" cars built as a simple solution of the difficulty without sacrifice of steering efficiency.

But the use of the armoured motor car is not all in favor of the Allies. For a long time past the Germans have suspected its possibilities, and now they are using it to a considerable extent. There is no doubt that the rush of the Germans on Paris was largely due to the possibilities of motor transport. They use these cars to send on for scouting work ahead of their cavalry, and it is only after the cars have reconnoitered to discover whether opposition in forces is likely to be met with that the cavalry patrols follow with the horse artillery close on their heels.

The Automobile for Soldiering

While the armored car is essentially for fighting, the transport car is for soldiering; there is a big difference. It is said that the huge modern army of the present day manœuvres on brains, boots and belly, and it is this that has given such an enhanced improvement to army transport. The brains, which have evolved modern fire arms and rapid means of mechanical transport, involve fronts of enormous length, which again involves the necessity for quick and often long-distance movements. Indeed, the effect of rapid army transport works in a circle of self-increasing radius —if that is possible. I mean this: that it makes conditions which call for still more rapid transport. The enormous areas of modern battles involve gigantic numbers of men all of whom have to be supplied with ammunition and food, the requirements being enormous. Troops also push further and more quickly from their rail head, for the motor has not yet in the least superseded the railway, which still must be the main carrier from the supply base, the rail-head affording the point of distribution to the various rendezvous or re-filling points. It is here between rail-head and re-filling point that the bigger transport motor is most largely used, sub-distribution from the re-filling points to the troops being effected very largely by horse transport, though even here the motor is invading the realm of established method.

What an Army Corps Eats

With such a huge and mixed army as that of the Allies, the difficulties of revictualing are considerable, owing to the fact that regiments are continually changing their quarters, and consequently the commissariat experiences difficulty in finding them. Accordingly, every day each army corps chooses a special station whence the regimental transport can fetch it daily. Of course such huge supplies as are required for an army corps, which is upwards of 40,000 men—its daily meat consumption runs to 120 head of cattle—are brought by railway, but where a railway is not available motor transport has been found quite equal to the task.

Motor Artillery

One branch in which the automobile has very pronouncedly left its mark has been in the transport of heavy artillery. It is in this branch that the Germans have excelled, for while the 3-in. French gun is the finest in the world of its sort, it cannot fire effectively beyond 9000 or 10,000 yds., while the heavy German guns have an effective range up to 11,000 yds.

But it is especially their howitzers for siege work, their 11 and 16½-in. guns that have been the cause which enabled the German flood to flow on past fortresses still held by the enemy. These big guns, the former, firing a 750-lb. shell, weigh complete 13½ tons, and, though often drawn by teams of thirty horses and upwards, are undoubtedly often moved by motor. Indeed, there is little doubt that it is largely due to the motor that their use has been rendered feasible in operations involving such mobility. It may be added that the wheels of all these big guns are fitted with what may be called footpads very similar to those on the well-known Pedrail tractor. These footpads, which are fitted on the wheel circumferences, are so arranged as to afford sufficient bearing surfaces to take the big weight of the gun on the road.

Fare Fighting

But the use of the motor has not been confined to the transport of goods. Let me quote an experience of Mr. G. H. Perris of *The Daily Chronicle*:

"When we were searching for something to eat and drink we came upon yet another surprise in the shape of a long line of taxi-cabs stretching through by-roads out of sight. Fifteen hundred of them there were, they told us, in the neighborhood.

"In my innocence I had supposed that infantrymen must march and cavalry ride, while wagons bring up supplies. But the internal combustion engine is changing many things. For a quick retreat, or a quick advance, or the transfer of cartridge cases from one wing to another, there is nothing, it appears, like the common or city taxi. So now I know exactly why we have to put up with old-fashioned fiacres on the boulevards." The Paris motor omnibuses too, fitted up to carry forty soldiers apiece, or to carry meat supplies indifferently, have also been doing useful work.

Transportation for Life

There is little need to emphasize the use of the motor for ambulance work. The horse ambulance has become quite the exception, which is scarcely surprising when one considers how any possible uncontrolled starting is eliminated, and how very much easier riding it affords. It may be worth while, however, to mention that both British Admiralty and War Office have had some of the London omnibuses adapted to this purpose.

The Versatility of the Motor

Besides for the mere transport of ammunition supplies and artillery, and even of soldiers, the motor is finding quite a variety of other uses: both sides are employing it to afford travelling wireless stations; the French are reputed to have well over twenty such. Again, equipped complete with dynamo worked from the car engine the illustrations published in the July issue of *The Commercial Car Journal* attest the extent to which traveling searchlights are being employed, while it is especially in connection with the aircraft and mechanical transport sections that three-ton chassis are carrying bodies fitted up as travelling workshops.

Where German Resources Are Dealt With

For years past, the German Army has specified for its requirements a four-ton truck and a two-ton trailer, the complete train loaded weighing about 11½ tons, and there is reason to think that while the German cars have naturally found French roads very suitable, they have not always found the bridges equally so. That such a possibility was more than suspected by the Germans is evidenced by the regulation, issued only a month or two previous to the war-outbreak, showing a leaning towards a lighter vehicle, but unfortunately for the Germans the reduction in weight was not sufficient to make much material difference, nor was the time sufficient in which to effect any real change.

In addition to a thousand trains with a total load capacity of 6 tons each, there is reason to think that there are another five hundred or six hundred working without trailers and dealing with loads from 3 to 4 tons.

It is a curious fact that of the total subsidized forces of German heavy motor trucks over 40 per cent. are provided by the brewing trades, which is so extensive in Germany that an official report states that in Bavaria: "There are so many brewers in Bavaria, and these are so densely distributed that there is no need anywhere to convey beer over long distances. Hence, there are practically no vehicles employed."

To Sum Up

A considerable number of the Allies motor transport wagons at various times fell into the hands of the Germans or got lost, and the same happened to German cars, though there is no reason to suppose such happenings were due intrinsically to the form of transport; on the contrary, the automobile has emphasized its greater safety from capture as compared with horses, to say nothing of its non-liability to stampede; there have been a good many cases of horses stampeding from the lines. On the whole the commercial car has most brilliantly answered its promise. What troubles have shown themselves seem

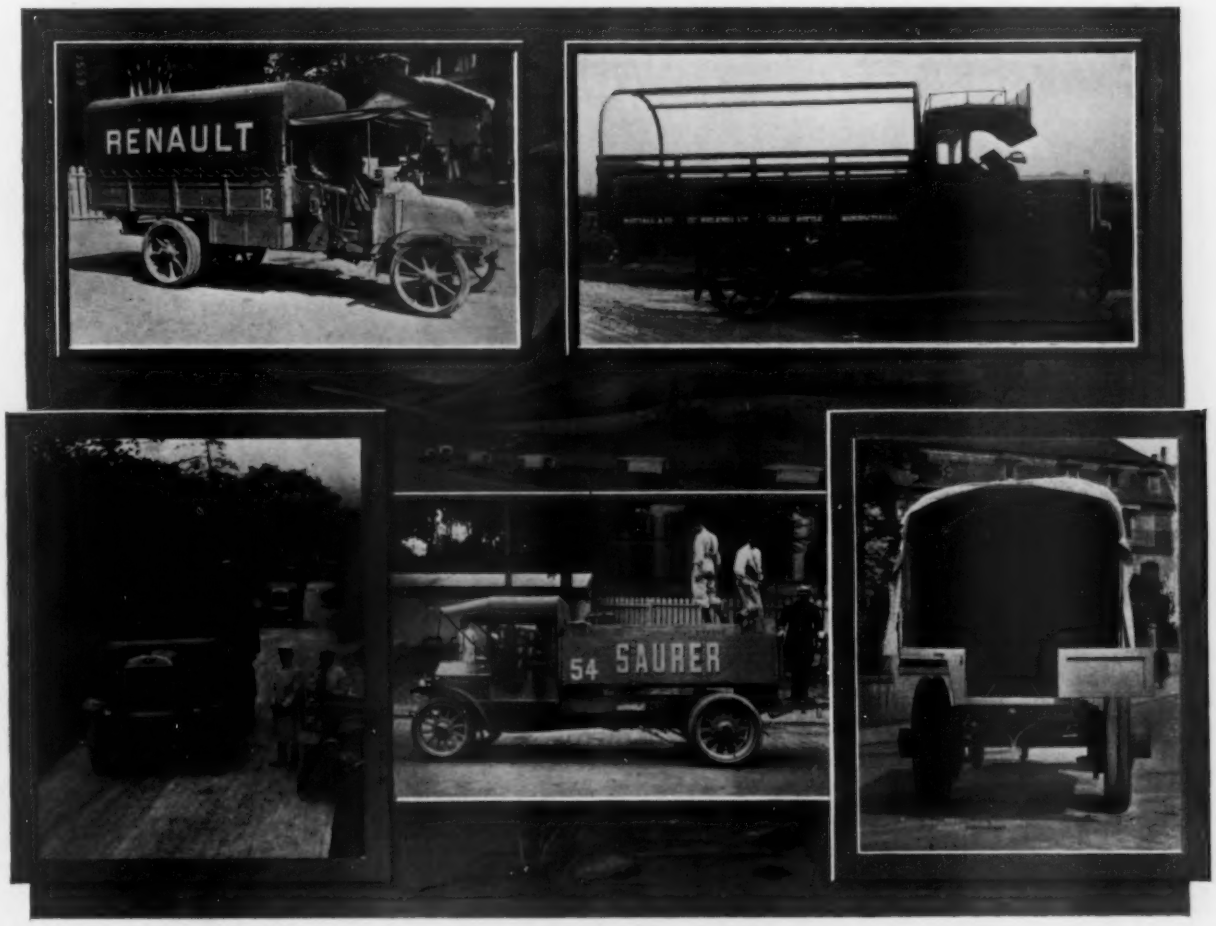
largely matters affecting the radiator, the working loose of bolts, or the breakage of springs; this more particularly in the case of vehicles not built for the French and Belgian roads (I am talking of the east side only). And in saying this it must not be forgotten that the German subvention requirements of late years have been formed with the conditions governing French roads always kept in mind.

While undoubtedly much motor transport has had to be abandoned at various stages of the war, notably by the Germans in their retirement from before Paris, it is admitted on all sides that, had horse transport been used, breakdowns and abandonments would have been far greater in number, and even in total load capacity and value. Breakdowns have occurred—plenty of them—but it must not be forgotten that the work that is being done by motors in this way constitutes by far the severest motor trials that were ever organized, for not only are chances of righting any defect reduced to a minimum, but there is no possibility of the experienced driver employed for the ordinary trial; in war the cars have to be driven as often as not by inexperienced men at savage speeds.

The motor in one way has affected modern warfare rather curiously, and in a way which, though it does not appear to have attracted attention, has, I believe, had a very great influence in the present campaign. Hitherto the speed of an army was limited by its transport, but with the advent of the motor that limitation is to some extent no longer imposed, since the transport can out-travel the army. In 1870 the German troops were marched fairly severely. I have spoken with men who in those day marched till, as they said, their boots were filled with blood, but apparently the German troops have been used more severely in this latest war; in fact it is indisputable that in many cases they have been marched over the line of utter exhaustion. Everything points to this—that with motor transport very nice judgment is required by commanding officers in estimating the capacities of their troops, since the generally automatic limitation of transport mobility is not imposed to the usual extent.

LIGHTER TRANSPORT UNITS AN EFFECT OF THE WAR

Not long ago there appeared in the pages of *The Commercial Car Journal* an article on "Are Present Methods of Transport the Best?" and in this article it was suggested that for retail work all tendencies were verging towards the use of a lighter type of body and higher frequency of service. Whether it be for these reasons or for causes peculiar to the war in Europe, certain it is that British users whose three-ton and 3000-lb. cars have been taken over by the army authorities are replacing their army-seized vehicles with others of smaller capacity, and speaking generally, correspondingly higher speed. With the present enormous government demand on the three-ton types, of course such a course may be dictated by the difficulty of obtaining trucks in the heavier sizes, but whatever the prime cause, certain it is that the result brought about will be very much that predicted a short time ago in this journal.



Trucks for European Armies

Upper left is a Renault two-tonner called away from the military trials, and now serving with the French forces. Upper right is a typical British subvention three-ton truck. It is a Leland, and was the first type of truck passed by the British military authorities. Lower left shows a Dennis three-ton subsidy model coming up a test hill in the recent British Subvention Trials, it being the only worm-driven truck passed for subvention by British Army authorities. Center illustrates loading up and checking a Saurer, a typical French Army three-tonner. Note the sandbox and pipe for distribution of sand under driving wheels when traversing slippery surfaces. Lower right shows the arrangement of a double-purpose wagon for troops or freight, as now being used by the German Army. With the floor flaps up, it affords sitting accommodation along each side; with the floor flaps down, a level floor for luggage.

Regarding the Confiscating of Cars in Europe

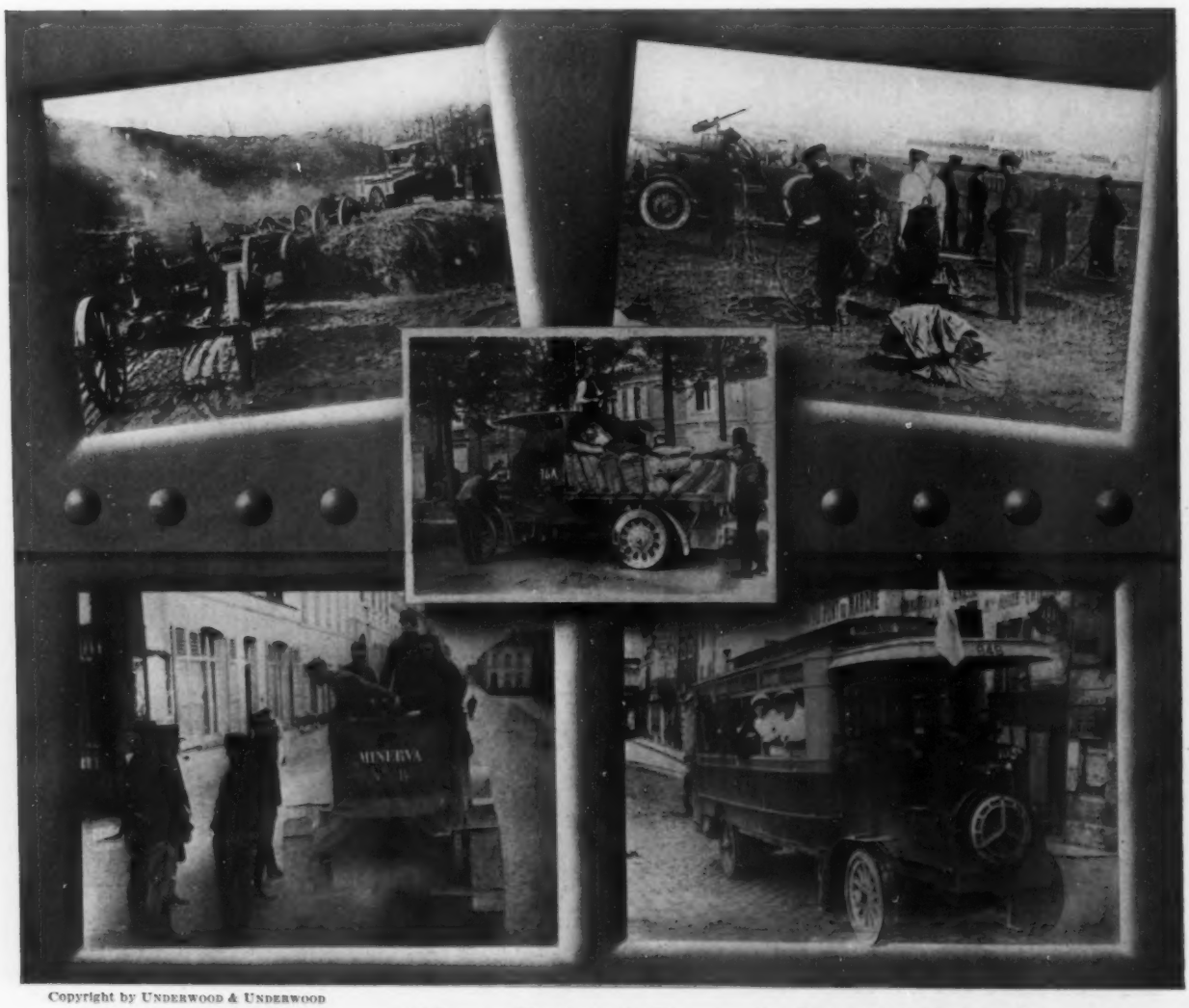
In certain American publications it is announced that in England they are not confiscating automobiles, but are doing so in Germany and other countries. In a way this is partly true, in a way it is not; for England has been commandeering motor cars in certain cases, more particularly commercial cars of load capacities ranging from thirty 1½ to 4 tons, the owner having no say in the matter. Yet though the owner has no option but to surrender his car to the military authorities, he is paid for it at the price fixed by them, and this figure though none too generous is, as a rule, not outrageously low.

As far as the smaller types are concerned, the private cars—probably the majority have been taken from works and show rooms, and in making their selection the government officials usually favor cars from 15 to 20 h.p. with engine capacities ranging from 180 to 240 cu. in., though in certain cases larger cars have been impressed.

Since the outbreak of war nearly all the large manufacturers of private cars in Great Britain have been paying attention to delivery van business, and nearly all are utilizing their chassis for this purpose, though such a hurried diversion in business involves some danger of the commercial delivery van being brought into disrepute by the employment of unsuitable chassis. No one can contend that the ordinary private car chassis, as it stands, is suitable for delivery van work, and those who without modifications utilize such machines for this purpose are not only jeopardizing their future, but asking for trouble almost in the present. Unless this is fully realized, and the private car manufacturers not only provide stronger springs but lower gear ratios, history may repeat itself, for this very thing happened in 1907, when there was a slump in the private car market, and a lot of totally unsuited private car chassis, disguised as delivery vans, were foisted on to unsuspecting purchasers, with the result that the commercial car was brought into much undeserved disrepute. Provided, however, that sufficient springs and suitable gears are used, there seems no reason why the average strongly-built British chassis should not be quite capable of good service in delivery of retail freight, and given these conditions, therefore, something may come of the projected campaign to educate the opinion of business men who have such deliveries to effect.

In considering the British August trade figures it must be remembered that the suddenness of the war was such as to inevitably cause just at the outset a depresssion far more acute than was justified later, or that has since been in evidence. Imports show a drop of $68,066,850 or 24.3 per cent. while exports have fallen off by $99,452,290 or 45.1 per cent., re-exports by $18,653,330 or 45.7 per cent.

Thanks possibly to the cutting off of the German supply of gasoline stock in Great Britain is higher than it has ever been before.



Important Part Commercial Cars are Playing in the European War Cannot be Overestimated

In the upper left is shown a German motor truck dragging a train of artillery across country. By means of these motors the great mobility of the German army was possible. Upper right, British flying corps breaking camp; location withheld by censor. Note the automatic gun mounted in the tonneau of the car. In the center are English trucks carrying supplies. Lower left shows armored cars used by the Belgians in the vicinity of Ghent, by means of which they are fighting the German Uhlans. Lower right, French motor omnibus from the streets of Paris, converted into an ambulance.

Typical Examples of the Advantageous Use of Trucks By Well-Known Firms of New York City

Special Heavy Hauling as a Motor Truck Business

By E. S. FOLJAMBE

COAL DEALER ANALYZES MOTOR DELIVERY COSTS

TYPICAL of coal firms who are using automobile trucks intelligently, is the firm of Olin J. Stephens, of New York City. This company, since the beginning of its use of trucks some three and a half years ago, has made a consistent study of ways and means of applying them effectively to the coal-hauling business. At the present time one man is employed especially for the purpose of analyzing costs and studying efficiency methods in the delivery system. This man was first put through an automobile school, put on the trucks as driver, went through a course of training in the shop, and is now making a study of the cost of delivery by truck with and without helpers. He speaks of it as a "stop-watch study," because the item of time enters largely into consideration. It is also a study of bodies, a matter of great importance in the handling of coal.

Developed Body Attachment

The ordinary hopper body is good only for hauling hard coal and is fitted only with a side discharge. The ordinary gravity discharge body empties at the rear. Both of these bodies are more or less inflexible, and are not suitable for trucks which, during the slack season, are rented out or exchanged for hauling other things, such as sand, cement, lime, etc. At first a body of 210 cu. ft. capacity was devised, with both rear and side discharge. By side-board attachments the height of the body could be altered. This led to the development of an attachment which goes on the rear of any dumping-body truck, giving it either side or end discharge as desired. This attachment is shown in the accompanying line drawing. It is of sheet metal and is applied to the rear of the body. The shelf-like sheet of steel forms the floor of the attachment when coal is delivered through the rear gate. By removing this sheet, however, the coal falls into a sloping chute for side delivery. At the end of this chute is attached the ordinary sheet metal chute which is used to deliver coal across a sidewalk.

Idle Time Eliminated

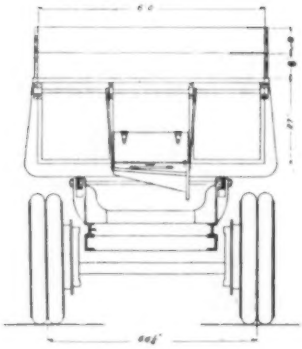
Not only does this attachment make out of an ordinary inexpensive body, a special dumping body, thus saving time, but it permits the truck to be used during the summertime by people that the Stephens Company hire extra wagons from in the winter during their rush season. This is done either on a cash basis or on an exchange basis. The idle time of the truck is entirely eliminated; it is kept busy the entire year and, what is more important, the men do not have to be laid off, but are retained and given steady employment. When the trucks haul crushed stone, ashes, sand, etc., the sides are cut down to 120 cu. ft. capacity, and no overloads to damage the truck result. The trucks are usually rented at a flat rate per day.

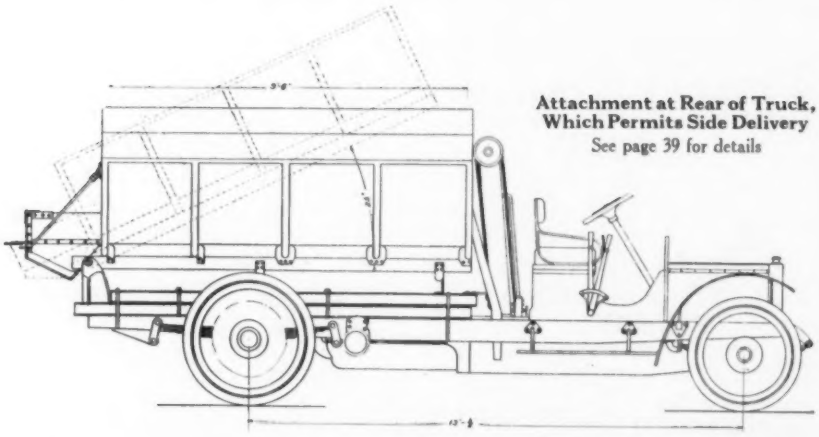
The fleet now in use consists of eight Saurers, and one Walter four-wheel drive; two Walter four-wheel drives, one of the short wheelbase type, with some trailers, which are now ordered. This tractor will be of the six-wheel variety, the forward end of the trailer resting directly on the tractor.

Coal Pockets Altered for Trucks

One entirely new coal yard has been constructed with the idea of the use of trucks in view, but others had to be altered. The gangways were lowered, and auxiliary discharge chutes above the floor of the pockets

Various Types of Bodies and Methods of Handling Coal Employed by New York Coal Companies





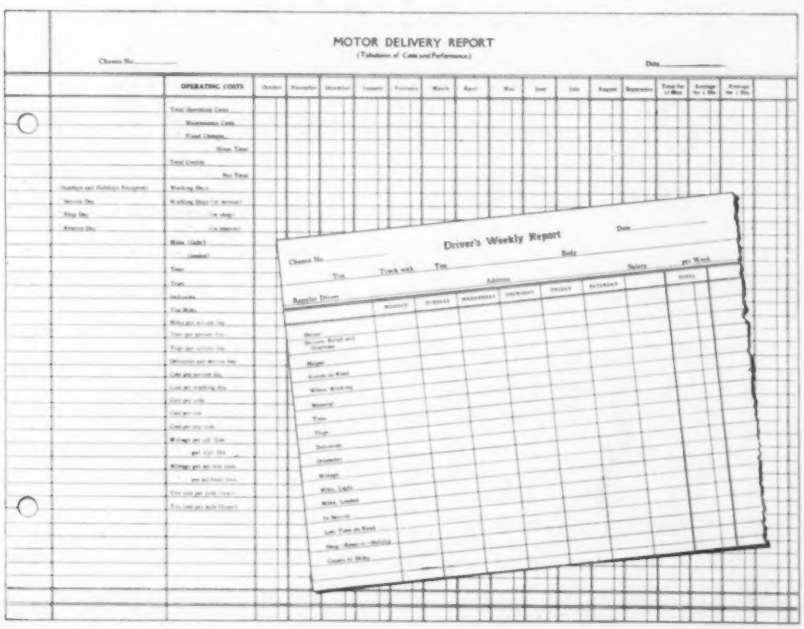
Attachment at Rear of Truck, Which Permits Side Delivery
See page 39 for details

were introduced, as one of the essentials is quicker loading and a quicker discharge. In one yard the trucks have their loads delivered directly to them by cranes from the barges.

On short hauls the truck cannot ordinarily compete, but with a quick discharge they can. The horse truck bodies are operated, even where dumping bodies are used, entirely by hand, while the automobiles have power hoists which are much quicker, but 40 seconds being required to raise the body to the greatest dumping angle of 45 degrees, and the empty body returns almost immediately to place.

As the teams can be hired even from outside contractors at $6 to $8 per day, and as the motor costs approximately double this amount per day, it must do the work of two- or three-horse teams in order to save money for its employers.

In winter hauling, and especially last winter during the blizzards, the trucks were found invaluable. A novel experiment was made, which showed the amount that trucks are interfered with by ordinary traffic. Trucks were sent out during the storm and the amount of work in the day noted. The same truck at night was able to do two-



Delivery Reports Used by Olin J. Stephens

thirds more work, as it was not interfered with by other vehicles, especially slow-moving ones or those stuck in the snow. The truck's ability to work 24 hours a day was greatly to its advantage.

Truck With Followers

It was found to advantage in the heavy snows to send out a single truck with three men equipped for digging. These broke the way, and two other trucks loaded to capacity followed directly in the wake. When asked about the trucks in the snow, Mr. Stephens said, "The trucks were life-savers."

Novel Traction Device

Block tires were found to give very good results in the snow, but non-skid devices in general were not very satisfactory. This resulted in the company's making up some plates, 12 in. by 36 in. long, from sheet iron. On the upper and under side of these plates cleats were riveted, and two of these plates were carried on each vehicle. On a bad spot, in which the wheels began spinning and would soon have buried themselves, the plate was inserted between the

wheel and the ground, the under cleats biting into the ice, while the upper cleats held the rubber tires. By this means the trucks were soon moved out of bad situations, which would have proved very difficult had the wheels been allowed to stand and spin.

Records

The record has been kept on a weekly basis by a record clerk in the garage on special blanks for this purpose, one of which is herewith illustrated. The superintendent fills in the cost blank (herewith also reproduced) from the weekly blanks. As usual, in the systematic employment of trucks, the vehicles each bear a number, and oil, gasoline, replacements, etc., are charged up to the vehicle. All repairs are done in the repair shop at night.

The garage force consists of a superintendent, a record clerk, an expert mechanic, a night mechanic and a general helper. During the wintertime the night man has a helper. Complete power plants or other parts of a truck which can be assembled in the form of units are kept for repair work. These can be installed in any chassis, thus allowing the head mechanic to repair during the daytime at his convenience motors which need attention.

Work Accomplished

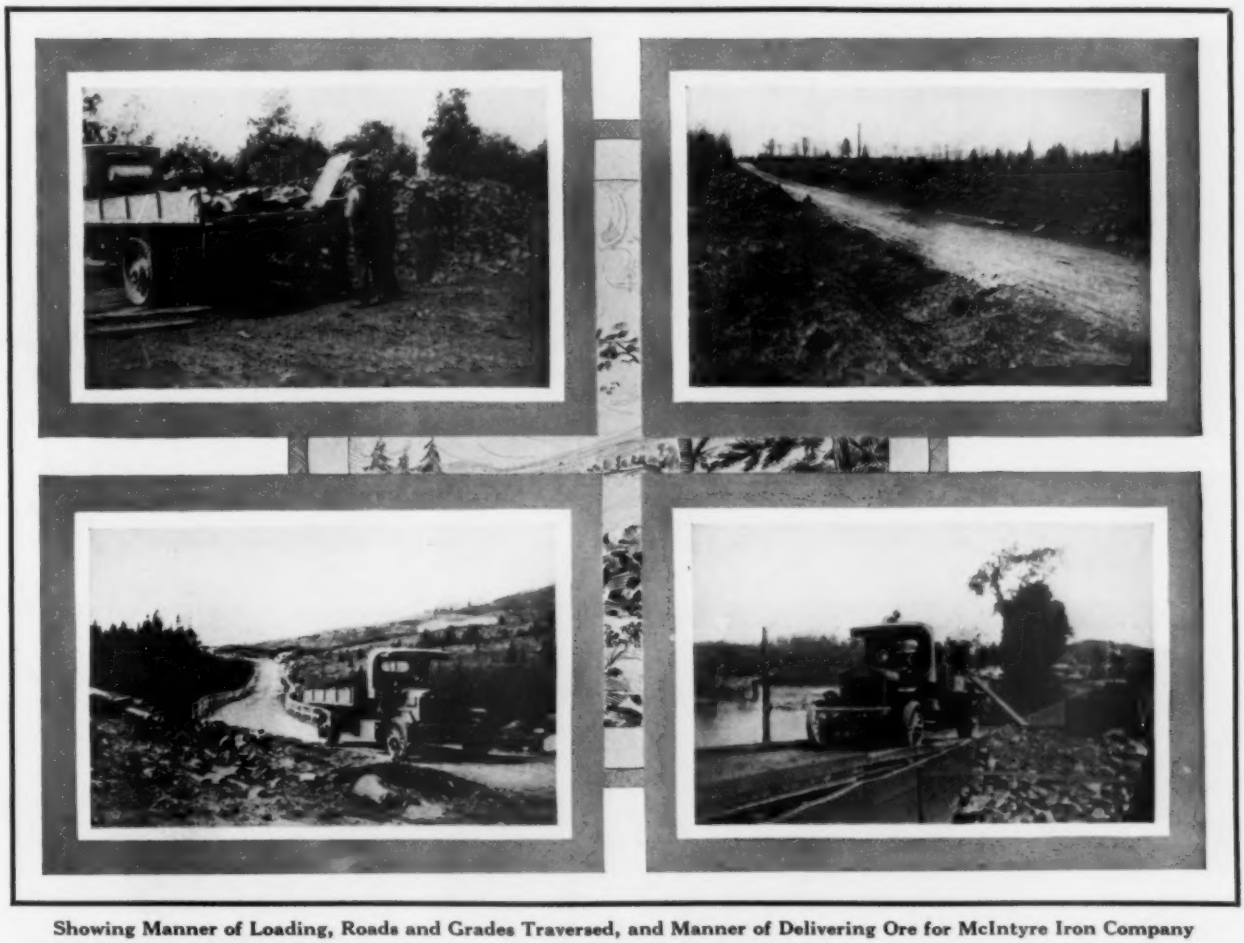
During an average day's performance these trucks deliver approximately 50 tons each during the 10-hour day. They work on a small radius of but 5 miles, as there are six receiving and delivering plants in the territory.

George H. Pride Specializes on Heavy Haulage

One of the most interesting uses of trucks in the Metropolitan District is that of George H. Pride, who specializes on jobs that other people don't want in the heavy haulage line. Among his patrons are such companies as the Atlas-Portland Cement Company, over one million bags having been carried for them last year; the Otis Elevator Company, for which concern he hauled over $15,000,000 worth of machinery last year, with the phenomenally low breakage of only $15. This low breakage was due to his intelligent drivers, and right here a word may be said as to Mr. Pride's method of handling drivers. In the first place he tells them they are not chauffeurs, but drivers who are delivering the goods. He makes them understand that there is an opportunity for each one of them to become something more than a driver if capable, and that they may be put in charge of larger operations where many men are employed. If they do not show personal aptitude and, what is more important, a personal interest in their work, they are dropped. A minimum wage of $21 and a maximum of $25 per week for driving is paid. These men seldom have helpers, as the consignees usually help unload, except where special machinery is being hauled.

His present fleet consists of four Saurers, seven Pierce-Arrows and a service car.

The most interesting records have been made, which, if they did not occur in the regular routine of business, would be termed stunts. He hauls on Saturday night all the city newspapers, except the *Journal*, to the distributing point at Yonkers. About eight thousand newspapers, amounting to 6 tons, are carried per load. From this point the papers are distributed Sunday mornings by wagon, trolley, on foot and in all manner of ways to the individuals. During the winter he carries the newspapers to 135th Street, near Lennox Avenue, and is said seven different times during the winter's snows to have saved the *World's* edition.



Showing Manner of Loading, Roads and Grades Traversed, and Manner of Delivering Ore for McIntyre Iron Company

Trucking Ten Thousand Tons of Iron Ore at the Rate of One Thousand Tons per Week

A most interesting feat in heavy hauling was performed last winter for the McIntyre Iron Company, 71 Broadway, New York City, with works at Tahawis, N. Y., in the Adirondacks. During the winter the ore was brought by traction engines with caterpillar rear wheels and runners on the front, with a man sitting on the runners operating the steering gear, over an iced road with sleighs as trailers to a point in the heart of a forest, known as Newcome Junction.

This road was daily sprinkled until coated 6 to 8 in. thick with ice. At this point the loads were dumped by the roadside, forming an enormous pile on each side, stretching away almost endlessly in the distance. Just as soon as winter broke, the trucks tackled the tremendous task of moving this quantity of ore within a specified time to North Creek, where it was to be loaded on the railroad. The grades were more than 15 per cent. in many places, and special trailers which had been made up to use with the Pierce-Arrow trucks were found impracticable, owing to road conditions and grades.

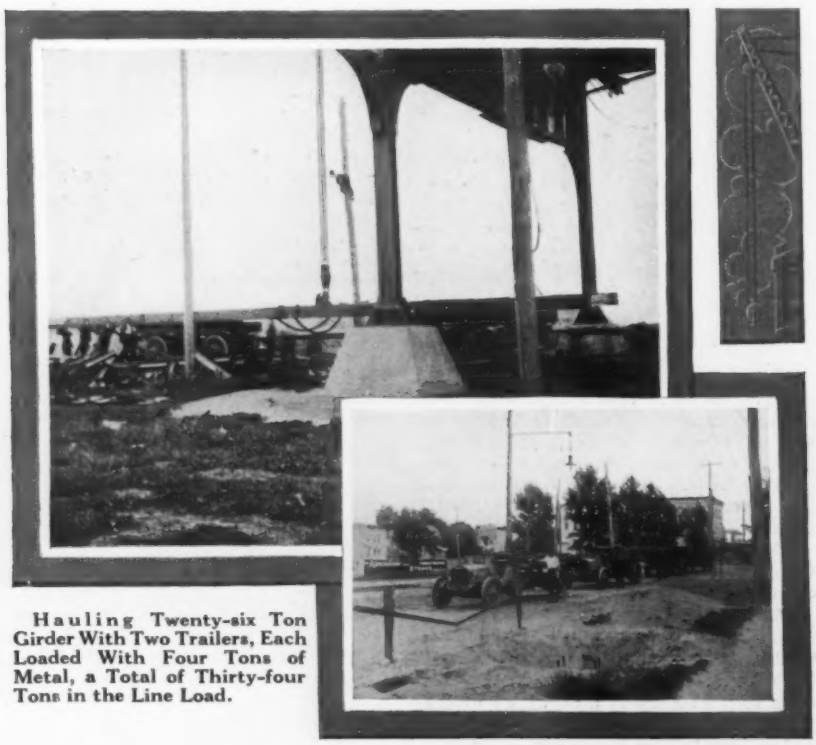
Water-Cooling the Brakes

Hauling was carried on both day and night. At the very beginning, an experience which nearly cost the participants their lives, proved that ordinary brakes could not be relied upon for such work. One night, fortunately for the driver, Mr. Pride and another man were on the truck, the brakes were completely burned out and the six-ton truck fully loaded came down a 15 per cent. grade, 1 mile long, and safely made a 160-degree turn at the bottom, the speedometer showing, after the excitement had subsided, a maximum of 30 m.p.h. If there had been but two men, results might have been different, but one devoted his entire time and attention to what brakes were left, the other operated the searchlight with which each of the vehicles was equipped, the third confined his attention to steering. After this hair-raising experience, four gasoline tanks were fastened to the rear of the seat of each truck, filled with water, and piped to the brakes. After water cooling was applied the brakes would sometimes last as long as 6 days.

The run to the point of delivery was 43 miles, so that a delay of 10 to 15 minutes in loading and unloading was not a serious item. For this reason, and to save expense, it was found expedient to load the trucks by hand, the ore being in chunks, some of which weighed as high as 500 lbs. The material was so heavy it ran 10 cu. ft to the ton, so that a truck filled up to the top of its 12-in. side boards had a capacity load. The rocks were all put in place by hand, large ones being lifted on a board by several men. It was found that at the bottom of the piles, even at the end of the work which was in the summer, that shovels could be used to clean up, as there was still a solid cake of ice several inches in thickness beneath. Each trip the loaded trucks climbed 1000 ft. and dropped 700, and the reverse on the return. At the delivery point loading into cars was facilitated by a 300-ft. maple runway, which, although its foundations for the supports were dug 3 ft. in the ground, supposedly below frost line, was continually sinking and rising and had to be braced from day to day. From this runway, which was parallel to the railroad tracks, the cars were loaded by hand, a shield, down which the rocks slid, protecting the side and bottom of the freight car. In 10 weeks the trucks did over 400,000 ton miles, satisfactorily completing a most difficult task, and one which it was contended could not be done by motor trucks.

Hauling Twenty-six Ton Girders

The trailers, which were made for the ore hauling, were finally used to good purpose in a very different manner. The Phœnix Bridge Company were facing the problem of moving a large number of twenty-six-ton girders for the Brooklyn Subway. These had to be loaded in a congested spot and hauled a mile from the railroad siding at Long Island to the side of the traveler at work on the subway. The roads were so bad and the space so contracted that the large number of horses that would have to be used were out of the question. Contractors said that trucks could not do the work, but the contract was taken at a price somewhat higher than that for horse hauling. Two of the special trailers which were made for Pride by Shadbolt, of Brooklyn, each having a rated capacity of five tons, and capable of carrying this load at 14 m.p.h., were placed one under each end of the twenty-six-ton girder. As the girder was lowered into position, these trailers were said to have visibly squatted under it, springing back again into normal position when relieved of the load. Two trucks, each carrying six tons of steel to give them traction, were hitched in tandem to the trailers and the whole moved successfully to the Brooklyn operation. In this way 13,500 tons of girders were moved, this being the first time in the knowledge of the writer where an entire steel job was handled by motor-driven vehicles as a regular business of hauling and not as an exhibition of the possibilities of motor-driven vehicles. It is needless to say that suitable profit was made on the job, and the work was done in much less time than it could possibly have been done by any other known means.



Hauling Twenty-six Ton Girder With Two Trailers, Each Loaded With Four Tons of Metal, a Total of Thirty-four Tons in the Line Load.

National Fireproofing Company Handling Fireproof Tile by Trucks, Competing With Horses on Short Haul, Even Without Special Loading Facilities

In New York City the National Fireproofing Company has averaged a delivery of 21,000 tons per month of fireproof tile for building construction. Although horses are still used, they have for this service five eight-ton Couple-Gear front-wheel driven trucks. The rear of the vehicles are ordinary wagons, with large heavy wheels fitted with steel tires. They average about 5 miles, loaded, and not over 7 m.p.h. when light. Each truck is now doing the work of about one and a half teams, but could undoubtedly do more if proper facilities for loading and unloading were employed. They are making this showing on a short haul of only 1 mile in length, and with hand loading. It takes from 40 to 45 minutes to load, requiring four to five men, the material being very breakable. An equal time is required in unloading. This loss practically kills the efficiency of the vehicles. Quicker loading methods are necessary, and it is understood that the company is considering the use of collapsible cages which can be loaded in the absence of the truck and swung by the derrick of the lighter directly onto the vehicle. At the point of destination much of this material has to be hoisted to the upper floors of the buildings under construction, and with the present method has to be piled by hand at the roadside, packed by hand on wheelbarrows and wheeled on to elevators, or packed in bundles and hoisted. With the cages this could be hoisted directly from the truck to the desired floor, or could be placed upon the ground by the derrick and later hoisted to the proper floor at once, eliminating all hand labor.

John H. Fullerton, who is in charge of the work, is responsible for the plans for

A Heavy Load of Fireproof Tile
Couple-gear front-wheel drive and regular wagon wheels at back

improving the loading methods. Mr. Fullerton estimates that fully 50 per cent. saving would result. More modern methods would also greatly decrease the breakage. With modern methods the trucks could easily do the work of three teams each and show a large saving. At the present time each truck costs $8.25 a day to operate, as against a team at $6, but even at this rate it is stated that the trucks are saving money over the teams, which is rather remarkable on such a short haul.

This installation only emphasizes the fact that in many places trucks are even displacing horses, where with more up-to-date mechanical equipment they could show a very large profit.

The Indian Refining Company's Fleet

The Indian Refining Company, in its numerous branches throughout the United States, is a large user of motor-driven vehicles. The New York City fleet consists of twenty-six trucks, the following makes being used: Autocar, Packard, Kelly, Indiana, Old Reliable and G. M. C.'s.

Most of these vehicles are for gasoline delivery, except a few stake bodies for hauling drums of gasoline and Havoline oil. The tank bodies are of special design, one of which is herewith shown.

This company began its use of trucks about 4 years ago, and has gradually added to the equipment. About 150 stations are now in operation in the United States. Some six hundred horses are still in use throughout the country, but it is the intention of the company to gradually displace them with motor vehicles. Even the salesmen are supplied with Ford and Metz runabouts. In Lawrenceville, Ill., where the plant is a mile and a half out of the city, a motor 'bus is supplied by the company and carries free of charge, to and from their homes, all the girls employed in the plant.

This company has found that as fast as trucks were introduced into the various towns, additional business resulted, so that the horses in use were not reduced as fast as might be expected. However, from present indications, large numbers of additional trucks will eventually be put in service.

Trucks in Use by the Indian Refining Company

Largest Bakery in the World Uses Motor Trucks Exclusively

A unique example of a modern business firm with the most up-to-date methods and buildings designed for motor delivery is that of the Loose-Wile Biscuit Company, of New York, with plant in Long Island City. This progressive firm has just erected a $2,000,000 plant of fireproof construction, made of concrete and steel, and the entire outside faced with white-glazed tile, and completely covered on the exterior with incandescent bulbs. The main building has in the side toward New York City 4600 lights, while the top is surmounted with the largest electric sign in the world—600 ft. long—the letters being 30 ft. in height, the tops 42 ft. from the roof, containing 4000 lights, making a most brilliant spectacle at night. This sign can be read at a distance of 5 miles. The ten floors provide 25 acres of floor space, this being the largest baking plant in the world, and claimed to be the only one in which every kind of baking known is done. The product includes 350 varieties. The plant includes an enormous garage, of similar construction to the main building, and capable of caring for 224 trucks.

Horses Completely Displaced

This company has disposed entirely of its horses in New York City and vicinity, and although large fleets of trucks are used by its numerous branches in the large cities of the country, these also use some horses; but in the Metropolitan District horses have been completely displaced, and the experiment is working out very satisfactorily.

The fleet of sixty-nine trucks, including a large number of G. V.'s, G. M. C.'s, both gas and electric, Packards, etc., was put in service August 1st. These trucks make as high as 150 stops delivering to jobbers and retailers. They cover a radius of about 30 miles; longer trips are covered by relays from the agencies. The fleet is very noticeable, as the bodies are large, of panel type and painted a bright, warm yellow, very suggestive of "sunshine," and carrying out the name of the product, "Sunshine Biscuit." The loads are very bulky, but are of such a nature that overloading is not very possible.

Vehicles Load Within the Building

The buildings were designed especially for motor delivery, and all loading is done inside. The office floor is practically the second floor, while the first floor corresponds to a basement or shipping floor. Trucks run into the building from the street level and load directly at the point where the goods have been piled for the particular route. Ample room is supplied for turning, for either side or rear loading, although the majority of the vehicles load from the rear.

Recent Buildings of Modern Department Store Planned for Motor Delivery

Nothing is more significant of the times than the fact that modern buildings are being planned with the most up-to-date facilities for using commercial cars. Companies that have for the past 5 or 6 years been experimenting with all types of delivery vehicles, when going into new quarters or erecting new buildings, plan for proper loading platforms and other facilities that will cut to a minimum lost time in handling goods.

Basement Loading Eliminates Handling

Lord & Taylor, of New York City, is a typical example. This company, for the past 5 years in the old store, has been a user of motor-driven vehicles. When the new and magnificent structure now occupied was erected on Fifth Avenue, it was designed expressly for the purpose of assisting in motor delivery, based on the past experience of this company. Every vehicle passes directly into the building, backs up to the routing cage, which contains the goods for the particular route to be covered, and is loaded in the basement. The building was designed with a U-shaped runway, extending around three sides of the basement; the fourth side is occupied by zigzag inclines, two for entering the building and two for leaving. These inclines are of moderate grade, not exceeding 6 per cent., and permit the vehicles to drive directly from the street into the basement; in fact, up to their particular loading platform. Forty vehicles can be loaded at one time. This does away with packing the goods into the routing cages, from which they are taken in push carts or hand trucks on to elevators, raised to the street level, pushed across the sidewalk to the vehicles and loaded from the curb and the sidewalk. All of this has been eliminated at once, leaving the street entirely free and unobstructed for the use of automobile and carriage patrons of the store.

Modern Delivery Service Used by Lord & Taylor

Stamping Telephone Facilitates Work

One of the latest devices for facilitating this work is a stamping telephone. When the package is received, the bill for which has to be O. K.'d, the operator at once calls up the credit department, slips the charge slip under a device attached to the side of the telephone, which at once lights a signal in the department above. If the charge is O. K., the operator in the financial department pushes a button and the slip is automatically stamped.

The Present Fleet

The present fleet of the trucks now in use consists of forty 1000-lb. G. V. electrics, two 1500-lb. Commercial trucks, one 1500-lb. G. M. C. electric and two two-ton G. V.'s The gasoline vehicles are as follows: fifteen Pierce-Arrow pleasure chasses, fitted with light commercial bodies; three 1500-lb. White trucks and one Packard pleasure chassis, with commercial body.

The Fleischmann Company's Fleet Includes Over Four Thousand Vehicles

The Fleischmann Company, well-known yeast makers, are one of the largest individual users of trucks in the United States, having a fleet of over four thousand vehicles. This company prides itself second only to the quality of its goods, on its dependable delivery, and the service which it renders the bakers. Their slogan is "In rain, in sunshine, in snow, or sleet, you'll find our wagons on the street," and also another slogan which is largely used by this company is as follows: "Our name is colloquial, the reason is clear, our yeast has no equal, our service no peer."

Dependable delivery is most essential with a product of this kind. It is perishable, and must be delivered in proper condition. Bakers throughout the United States are dependent upon the prompt and consistent delivery of this most essential thing in their baking business. The entire delivery organization understands this, and every man prides himself on delivering the goods, no matter what hardship or what he may go through in order to do it on time. Every man is made a booster for the organization, and is paid his regular wages, even through long protracted spells of sickness, but in return the company demands his entire time, and does not permit outside work by an employee.

In illustrating the lengths to which the Fleischmann Company go to insure delivery, Mr. Thomas J. Brown, eastern division purchasing agent, cited the use of special trains both from the east and from Chicago to Dayton and vicinity during the floods of the past year, so that the bakers in that

All Styles of Bodies Are Used by the Fleischmann Yeast Company

section, although the Cincinnati branch of the Fleischmann Company was incapacitated, were not held up on deliveries. This remarkable delivery system is largely made possible by the use of the four thousand trucks mentioned. The territory of the company is divided into three sections, eastern, central and western, there being nine factories, as follows: two in New York City, two in Peekskill, two in Baltimore, two in Chicago and one in Sumner, Wash., and over four thousand distributing branches. In the eastern section alone, with headquarters at New York City, over twenty-five hundred motor trucks are used. These are of all types, a large number being Waverley electrics, fitted with special bodies. These are of 600 to 1000 lbs. capacity. The bodies have refrigerator type walls and carrying compartments for ice, as the yeast must be maintained at a fairly uniform temperature, and in hot weather would soon be ruined if ice were not carried.

These electrics have a range of from 40 to 45 miles on a single charge, and carry twenty-eight cells of lead batteries. In addition to this a large number of Fords and some Schachts are also used for retail deliveries, while some very large trucks are used for hauling in bulk from the factories to the trains and from the trains to the distributing stations. For this work two three-ton Packards, one two-ton Packard and one five-ton Packard are used, as well as one five-ton Stegeman, one three-ton Stegeman and one 1500-lb. Stegeman. All these are employed in hauling the yeast in bulk. The vinegar department also uses one five-ton Packard, and the whiskey department two three-ton Packards.

These big trucks go on at 9.00 o'clock at night to the Pennsylvania Railroad Station and get the bulk yeast shipped from the Peekskill branch in refrigerator cars. These large boxes of yeast in one solid cake are delivered to the distributing branch, where they are cut up into pound cakes about the size and shape of butter, wrapped and packed for delivery to the bakery trade.

The electrics go as far as 125th Street, starting about 5 a.m. and returning any time between 11.30 and 3.30, when they are put on charge for the next day in the company's own garage, which is completely equipped for handling all types of vehicles. Some of the larger cars deliver to the agency at Bronx, at Webster Avenue and 184th Street. In the Bronx section twelve cars are used, nine electrics and three gas cars. The two-ton Packard leaves the downtown garage at about 6.00 a.m., gets back at 9.30 in the morning, is loaded for Jersey City and from there goes to Newark, getting back at about 2.00 to 3.00 p.m., having covered from 50 to 55 miles as an average day's work. From these stations in Jersey City, Newark, etc., the smaller trucks deliver.

The salaries of the drivers vary according to their standing with the company, as these men are not chauffeurs, but are salesmen, and are employed and paid as such, but each drives one of the small vehicles.

Trucks are very valuable in special delivery to steamships, docks, and to the navy yard where battleships, etc., are being fitted out. Trucks are also held on duty both day and night and on Sundays for special delivery to hotels or to bakeries from whom emergency calls may be received.

THE ELECTRIC VEHICLE FLEET OF THE NEW YORK EDISON COMPANY

Standardized Recent Improvements Which Increase Efficiency

THROUGH the standardization of battery equipment in all the 1000- and 2000-lb. wagons, a considerable saving has been effected in the operation of the electric vehicle fleet of the New York Edison Company. Just how important this is may be better understood when it is considered that sixty-six of the one hundred and thirty vehicles comprising the fleet were concerned in the change.

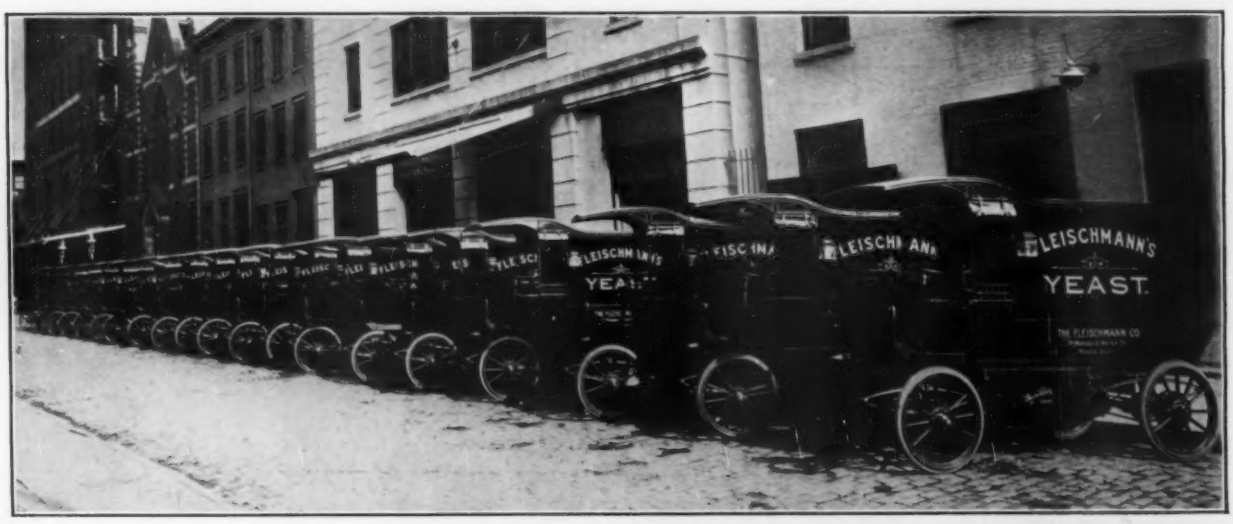
The Edison Company has thirty-six 1000-lb. wagons and thirty 2000-lb. machines. They include lamp wagons, tower wagons, emergency wagons, meter wagons and wagons for general delivery work. There are, of course, wagons from the factories of many manufacturers, each with its different equipment requirements. Batteries were represented in great variety. During the past spring and summer the odd-sized vehicles, seventeen in all, were rebuilt. Some were lengthened and some were shortened. Now the wagons are of a uniform size, and any one of the seventy storage batteries carried in stock may be used in any one of the sixty-six vehicles.

Cable-Pulling Improvements

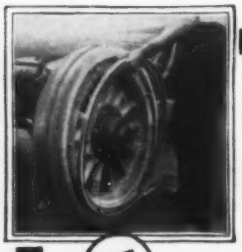
In the operation of the big cable-pulling trucks by the distribution department of the Edison company, the traffic of New York City's busy streets has caused more or less difficulty. These trucks are equipped with a motor-driven winch by which the heavy lead-covered cable is pulled into the underground ducts, a small steel cable passing from the winch through an idler attached to the front of the vehicle under the driver's seat, and on into the manhole. This made it necessary for the truck to take a position with the idler directly over the manhole. Not infrequently this position left the body of the truck directly across the cross walk or out in the tide of vehicular traffic. Needless to say the position was not appreciated by those who were inconvenienced.

This difficulty has been entirely overcome by placing additional idlers on each of the cable-pulling trucks. One of these is at the rear and another on the left side. Now the trucks may draw up facing the manhole, may back up to it or draw alongside. By passing the rope through the proper idler the work is executed as expeditiously as by the old method, yet without causing any inconvenience to the passing traffic.

A motor of 1½ h.p., added to the equipment of the Edison tower wagons, has done away with the laborious task of hoisting these heavy wooden structures every time an arc lamp was to be trimmed. The motor does the work that was formerly done by means of a hand crank and drum. The motor is controlled by the lamp trimmer on the tower. The vehicle draws in beside the pole, the trimmer closes his switch and the motor lifts the tower. When the work is completed the motor lowers the tower within its supporting frame. By no mischance may the chauffeur start the wagon before the trimmer is ready, for while the tower is in the elevated position the circuits between the storage battery and the motors which operate the vehicle are broken.



Part of the Fleischmann's New York Agency Fleet



Don't Experiment---

Equip your trucks with

United States Motor Truck Tires

(DEMOUNTABLE)

They are the standard truck tires of the world.

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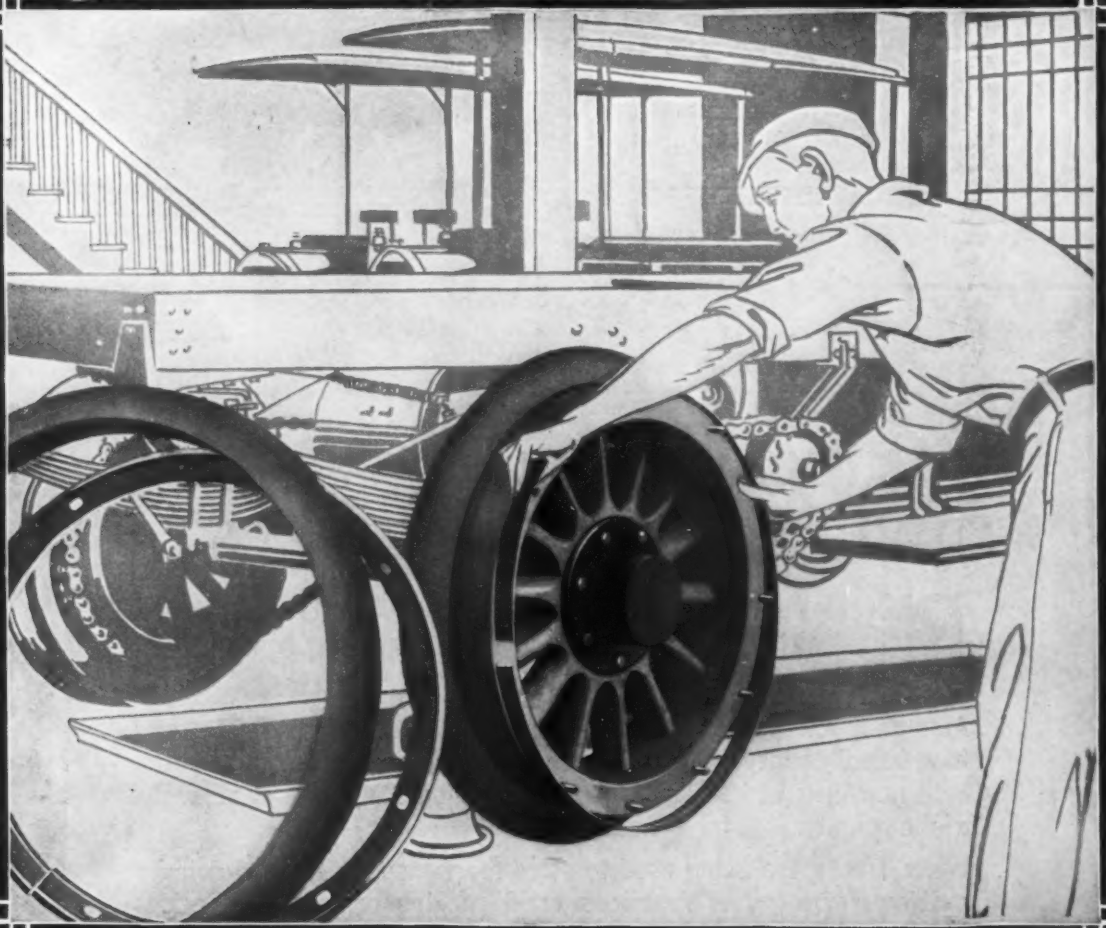

THE UNITED STATES TIRE COMPANY maintains real service stations in the following cities

Atlanta, Ga., 495 Peachtree St.
Baltimore, Md., 1102 Cathedral St.
Birmingham, Ala., 423 S. 20th St.
Boston, Mass., 560 Commonwealth Ave.
Buffalo, N. Y., 733 Main St.
Butte, Mont., Cor. Park and Idaho Sts.
Charlotte, N. C., 14 S. Church St.
Chicago, Ill., 1222 Michigan Ave.
Cincinnati, O., 1121 Race St.
Cleveland, O., 1908 Euclid Ave.
Columbus, O., 89 North Third St.
Dallas, Tex., 2109 Commerce St.
Dayton, O., Second and Jefferson Sts.
Denver, Colo., 215-217 16th St.
Des Moines, Iowa, Masonic Temple
Detroit, Mich., 243-245 Jefferson Ave., E.
Fresno, Cal., Masonic Temple Bldg.
Grand Rapids, Mich., 17 Library St.
Hartford, Conn., Allyn and High Sts.
Houston, Texas, 706 San Jacinto St.
Indianapolis, Ind., 527 North Capitol Ave.
Jacksonville, Fla., 804 Main St.
Kansas City, Mo., 1815 Grand Ave.
Los Angeles, Cal., 923-925 S. Grand Ave.
Louisville, Ky., 904 S. Third St.
Milwaukee, Wis., 454 Milwaukee St.
Minneapolis, Minn., 1522-1534 Hennepin Ave.
Newark, N. J., 276 Halsey St.,
New Haven, Conn., 238 George St.
New Orleans, La., 609 Baronne St.
New York, N. Y., Broadway & 58th St.
Oklahoma City, Okla., 508 N. Broadway
Philadelphia, Pa., 329-331 N. Broad St.
Phoenix, Ariz., Cor. N. Central Ave. and Fillmore St.
Pittsburgh, Pa., 5929-31 Baum St., E. E.
Portland, Ore., 24-26 Fifth St., North
Providence, R. I., 18 Snow St.
Richmond, Va., 709 W. Broad St.
Rochester, N. Y., 195 East Ave.
Salt Lake City, Utah, 132 East Second So. St.
San Antonio, Texas, 433 Main Ave.
San Francisco, Cal., 50 Fremont St.
Savannah, Ga., 307 Bull St.
Seattle, Wash., 212-216 Jackson St.
Spokane, Wash., 1011-13 First Ave.
St. Louis, Mo., 3149 Locust St.
Syracuse, N. Y., 117½ W. Taylor St.
Tacoma, Wash., 1316-18 A St.
Toledo, O., 218 North Erie St.
Washington, D. C., 1303 H St., N. W.
Wilkesbarre, Pa., 60 North Main St.
Worcester, Mass., Graphic Arts Bldg.

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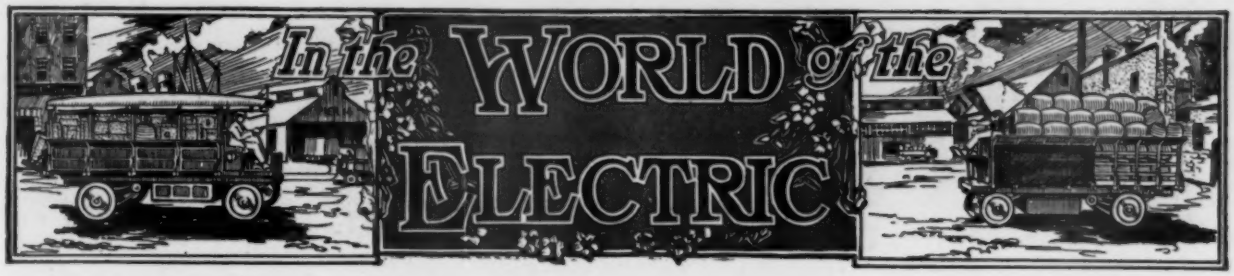
UNITED STATES TIRE COMPANY

1790 Broadway, New York City



Fifth Annual Convention of E. V. A. at Philadelphia to Outclass All Former Events

Everything is practically in readiness for the opening of the Fifth Annual Convention of the Electric Vehicle Association of America, which will be held Monday, Tuesday and Wednesday, October 19th, 20th and 21st, at the Hotel Bellevue-Stratford, Philadelphia.

The tentative business program, as developed to date, is as follows:

Morning Session—October 19th

10.00 A. M.—Mayor Blankenburg's Address, 30 minutes.
10.30 A. M.—President's Address, 45 minutes.
11.15 A. M.—Executive Secretary's and Treasurer's Reports, 30 minutes.
11.45 A. M.—Reports of Sections, 30 minutes.
12.15 P. M.—Report of Constitution and By-Laws Committee, 10 minutes.
12.30 P. M.—Appointment of Nominating Committee.

Afternoon Session—October 19th

2.00 P. M.—Report of Committee on Membership and Formation of Sections, 15 minutes.
2.15 P. M.—Report of Insurance Committee, 5 minutes.
2.20 P. M.—Report of Papers Committee, 5 minutes.
2.25 P. M.—Report of Committee on Operating Records, 5 minutes.
2.30 P. M.—Report of Committee on Legislation, 5 minutes.
2.35 P. M.—Report of Garage and Rates Committee, 10 minutes.
2.45 P. M.—Report of Committee on Educational Courses, 10 minutes.
2.55 P. M.—Report of Standardization Committee, 10 minutes.
3.05 P. M.—Report of Traffic Committee, 10 minutes.
3.15 P. M.—Report of Good Roads Committee, 5 minutes.
3.20 P. M.—Report of Committee on Central Station Co-operation, 10 minutes.
3.30 P. M.—Report of Committee on Parcel Post Delivery, 10 minutes.
3.40 P. M.—"Progress of the Electric Vehicle," by James H. McGraw, 40 minutes.
4.20 P. M.—"Electric Vehicles in Parcel Post Service," by William P. Kennedy, 45 minutes.

Evening Session—October 19th

8.00 P. M.—"Electric Vehicle Charging," by J. F. Lincoln, 30 minutes.
8.30 P. M.—"Special Applications of Electric Trucks," by F. Nelson Carle, 60 minutes.
9.30 P. M.—Report of Moving Picture Film Committee, 5 minutes.
9.35 P. M.—Moving Picture.

Morning Session—October 20th

10.00 A. M.—"Electric Vehicle Performance," by Robert B. Grove, 45 minutes.
10.45 A. M.—"Effects from the Utilization of the Kinetic Energy of an Electric Vehicle," by T. H. Schoepf, 45 minutes.
11.30 A. M.—"A Wider Dissemination of Electric Vehicle Information," by T. I. Jones (a lecture), 30 minutes.

Afternoon Session—October 20th

2.00 P. M.—"Calculations of Electric Motor Characteristics and Prediction of Vehicle Performance," by A. A. Nims, 60 minutes.
3.00 P. M.—"Educating the Public in the Field and Use of the Electric Vehicle," by F. C. Henderschott, 45 minutes.
3.45 P. M.—"Power Wagon Operation in Central Station Service," by W. A. Manwaring, 30 minutes.
4.15 P. M.—"Electric Fire Apparatus," by (Chief) George S. Walker (a lecture), 45 minutes.

Morning Session—October 21st

10.00 A. M.—"The Design and Performance of Electric Vehicle Motors," by H. S. Baldwin, 45 minutes.
10.45 A. M.—Symposium—"The Electric Industrial Truck," by Manufacturers, 60 minutes.
11.45 A. M.—"The Cost of Electric Vehicle," by George H. Kelly, 45 minutes.
12.30 P. M.—Report of Nominating Committee and Election of Officers.

Afternoon Session—October 21st

2.00 P. M.—"European Development of the Electric Vehicle Industry," by P. D. Wagoner, 30 minutes.
2.30 P. M.—"Constant Potential Systems for Charging from Motor Generators," by H. P. Dodge, 30 minutes.
3.00 P. M.—"The Motor Truck in Traffic Congestion," by Lieutenant William D. Mills (a lecture), 30 minutes.
3.30 P. M.—No. 30 (Louis E. Burr).
No. 31 (H. H. Doering), 60 minutes.

Of all the striking novelties that are destined to add exceptional attractiveness to the convention the moving pictures illustrating the sale of electric trucks is sure to be the most striking and unusual.

This moving picture film has been especially gotten up for this convention. The play begins with F. W. Smith, who is president of the association, discovering that the death of two horses has crippled his firm's delivery department. Harvey Robinson, secretary of the association and in the play secretary to Mr. Smith, calls attention to a letter received from A. F. Marshall calling attention to the value of electric vehicles in delivery work. W. C. Andrews and F. Nelson Carle, the last named of the General Vehicle Company, deliver to the Engineers' Club a letter from Mr. Smith asking information on trucks.

FRANK W. SMITH, President

Marshall requests Stephen G. Thompson, the central station representative, played by Mr. Thompson himself, to give Mr. Smith the points he asks for.

President Smith is interviewed by a consulting traffic and transportation engineer and two gangs of battery salesmen, who explain the merits of their product. Charles Blizard and Bruce Ford, W. G. Bee and H. H. Smith and P. D. Wagoner, of the General Vehicle Company, all volunteer their salesmanlike services to show President Smith what he needs in the way of electric truck equipment.

To drive home the lesson there passes in review in front of the window a host of electric vehicles devoted to all kinds of uses and thereby demonstrating the applicability of electrics to any problem. As a result Smith ends by placing an order for ten trucks.

While there will be special interest to electric people in seeing on the films the well-known faces of men prominent in the trade, the pictures have a serious purpose, for they show a lot of valuable information as to the way for getting to the right viewpoint when the purchase of a truck is contemplated.

Simultaneous with the proceedings of the convention there will be an exhibition in the Red Room of the Bellevue-Stratford. It will last all three days and will include batteries, rectifiers, charging apparatus and everything for the maker, user or dealer.

Interesting as showing the early stages of the electric vehicle will be a paper read by Pedro G. Salom, who, with his partner, Mr. Morris, is given credit for having invented the electric twenty years ago. When the first primitive steel-tired vehicle was seen on Philadelphia streets, moving along at a dizzy pace of about eight m.p.h., it made a sensation.

Special effort is being made for the entertainment of the wives and other feminine connections of members who will be

there for the convention, and also for their sisters resident in this city and using electric pleasure cars. The programme in brief is as follows:

Monday afternoon—In electric vehicles the ladies will be taken to the Curtis Publishing Company and John Wanamakers, and will be shown through both plants.

Tuesday morning, 11 o'clock—The party will leave the Bellevue-Stratford for a drive through the beautiful suburban territory north of Philadelphia, passing such beautiful estates as those of the Countess Santa-Eulalia and the Widener and Elkins families. Coming back via Chestnut Hill, the party will pass the Houston and Woodward estates and luncheon will be served at the Manheim Cricket Club. The day's charming ride will terminate with a run through the Wissahickon, West Park, etc.

Tuesday night—Vaudeville and dance at the Bellevue-Stratford. Included in the programme will be two sketches by members of the Philadelphia Electric Company. One is entitled "New and Cheaper Electricity," with apologies to Dr. Steinmetz, and the other "Mr. Ed. Uphoff." The latter includes character songs and is said to bristle with humor. The dance will follow.

Wednesday morning—Trip to the Navy Yard. Luncheon at the Bellevue-Stratford.

Wednesday afternoon—Tour of historic central Philadelphia, Independence Hall, Carpenter's Hall, Franklin's grave and Christ Church.

At the vaudeville and dance on Tuesday night it is the purpose to have present all local women users of electric cars. As far as possible invitations are being sent to these, but any woman who has been overlooked will confer a great favor by getting in touch with the local representative of the company that sold her her car. All these are members of the committee.

As part of the plan to make the convention an occasion for giving to the business public a great mass of data bearing on the possibilities of both the pleasure and commercial electrics, the papers to be read and subject to be discussed will be directed largely to the treatment of live, present-day problems.

The article, "Electric Fire Apparatus and its Advantages," to be read by George S. Walker, chief mechanician of the Philadelphia Fire Department, is looked to with especial interest.

Mr. Walker was largely responsible for having obtained the introduction in Philadelphia Fire Department of eight electric fire fighting machines. He is enthusiastic over what they have accomplished and in his paper will undertake to tell to the many fire chiefs and officials from other cities, who are expected to be present, what an electric can do while battling with fire in the congested parts of the city.

During the convention it is planned to have a public demonstration of what the electric can do in this kind of work.

Equally practical will be the address of Lieutenant William B. Mills, admittedly a foremost expert on the subject of street traffic, its congestion, and its regulations.

Nelson F. Carle is going to give some idea of the many applications of the electric vehicle to commercial uses in a paper which has called for most extended research and which will bristle with facts for the business man who is striving to get better results in his delivery department. This paper will be supplemented by a large number of most interesting and varied photographs, presented by stereopticon views.

A special invitation will be extended to business men to hear this paper, because it presents the varied applications in which the electric has brought successful results.

By a coincidence it happens that the thirty-fifth anniversary of the invention of the incandescent lamp takes place on October 21 while the convention will be meeting at the Bellevue-Stratford. A fitting recognition of one of the master achievements of the greatest of American electricians is now being arranged. It is planned to have Mr. Edison at the convention for a big testimonial to his honor.

A. S. MARSHALL, Executive Secretary

During the past year twelve sections have been added to the two existing at the time of the Fourth Annual Convention held last year in Chicago, bringing the sectional representation up to fourteen.

The reports of the especially active committees will reflect great progress, communicating many important developments that are of considerable benefit to the industry generally.

DETROIT E.V.A. DISCUSSES PROBLEMS

The Detroit section of the Electric Vehicle Association, with some fifty members, held its regular monthly meeting, October 8th. The feature was a paper by J. C. Ayers, of the General Motors Truck Company, extracts of which follow.

The officers of the Detroit section are as follows: G. W. Brennen, of the Detroit Edison Company, Chairman; Hal C. Smith of the General Motors Truck Company, Secretary, and Wm. Gordon, of the Century Electric Car Company, Treasurer.

The Detroit section is one of the real live units of the E. V. A., and the excellent work accomplished is especially commendable.

A BRIEF HISTORY OF THE ELECTRIC VEHICLE ASSOCIATION OF AMERICA

THE coming convention of the Electric Vehicle Asociation of America, to be held in Philadelphia, October 19, 20 and 21, will complete its fourth year of activity.

This national movement was the outgrowth of an earlier local activity in New England and its adopted slogan is "The promotion and adoption of the electric vehicle for pleasure and business purposes."

The association was organized with a charter membership of twenty-nine, to which was added the membership of the local New England organization, ninety-one, bringing the total enrollment at the time of its first convention, held in New York City in October, 1910, to 120.

One of the important ideas which the organizers of the national movement had in mind in the formation of this association was the solicitation of a co-operative advertising fund to spread the gospel of the electric vehicle and educate the public in its merits. Due to certain conditions this fund was not completed until early in the association's second year. The first advertising campaign was most successful and was continued for a second year to gain full advantage of the accumulative value of the first year's campaign. Approximately $80,000 was expended in this direction.

The rapid growth of the association and its broad field of usefulness to its membership made it imperative in a short time that a salaried secretary with a competent staff be organized to carry on the association's work. This was accomplished during the past year, and A. Jackson Marshall was appointed to the office of executive secretary with staff and headquarters at the Engineering Societies Building, New York City.

The various committees—some of which are Standardization, Operating Records, Central Station Co-operation, Parcels Post, Garage and Rates, Insurance, Educational, Legislation, Good Roads and Traffic—have been very active both throughout the past year and since the association's organization and have achieved much good for the industry.

A notable activity on the part of the association during the past year has been its propaganda on behalf of the electric vehicle for the parcels post service, for which service it is so admirably adapted.

The Membership Committee has outshone itself in the year now coming to a close, and the membership curve has taken an abrupt upward direction. From a membership of 479 at the conclusion of the Chicago Convention in October, 1913, it now totals more than 900, and strong hopes are entertained toward crowding the one thousand mark at the time of the 1914 convention.

From branch sections in two cities a year ago, Boston and Chicago (with national meetings in New York City), there have been organized and established sections in Phi'adelphia, Washington, Los Angeles, San Francisco, Cincinnati, Detroit, Cleveland, Toronto, Denver, St. Louis and New York City, with prospects of several additions in the near future.

Electrical Exhibition and Motor Show, at New York, Reveals Wonderful Development in Electrical Field

ELECTRICITY—that versatile and mysterious agent which is being adapted to thousands of uses in the industrial world and in the modern home, is once more having its inning at the Grand Central Palace, New York City, from October 7th to the 17th. Although still baffling the most learned scientist as to its very nature, the many uses to which it is put and the innumerable manifestations of its energy are being shown in all phases at this exposition. While it is said that the electrical field is only in its infancy, one is led to believe after visiting the exposition that it must have discarded its swaddling clothes a decade ago. On every one of the three floors devoted to the show the advances and development are apparent. Only a few years ago the first exposition of its kind held in the metropolis at the Madison Square Garden totaled only a mere handful of exhibits, while at the present exposition about one hundred and twenty concerns are exhibiting their products.

Although it is our purpose to review only that portion of the show which relates to the commercial car industry and its kindred lines, a few words regarding the show as a whole should be of interest to our readers.

In the first place one is impressed with the beauty of the exhibit, and the decorative scheme employed. Instead of the latter being overdrawn, recourse has been given to a very simple scheme which does not in any way distract the eye from the exhibits themselves. Each space is enclosed in a low, white-enameled wood fence, while the name of the company is prominently lettered in bronze on a white panel at the top of two ten-foot columns. With thousands of electric lights throwing their beams in all directions, the interior is practically flooded with light, and from the balcony the scene is dazzling.

The exhibits are divided into three classes—household, governmental and industrial.

In the first class all such appliances that reduce the drudgery of housekeeping are included, from complete electricity-operated kitchens, to a small curling iron from milady's dressing table. Vacuum cleaners, washing machines, heaters, sewing machines, irons, in fact anything that can possibly be operated by electricity for the home is being exhibited.

The government exhibits are without doubt attracting the most attention—inasmuch as electricity is playing such an important part in the operation of modern warfare. Five departments are included in the government exhibits. The first shows how cartridges are manufactured at the Frankford Arsenal, the various processes being shown, from the drawing of the brass shell to the loading and fixing of the steel-jacketed bullet.

The United States army exhibit features a wireless field signalling device the generator of which can be carried on the back of a pack mule, yet it is so powerful that it will produce sufficient current to operate the wireless set.

The United States Navy. In this exhibit a 40-ft. bridge, the crow's nest, and a gun turret of a modern battleship are shown in duplicate. This exhibit represents a value of more than $10,000. The wireless equipment of a ship of war is demonstrated by the Electrical Class from the Brooklyn Navy Yard.

In the Department of Commerce and Labor, Bureau of Census Department, the complexity of the work connected with taking of a census is explained. By means of electricity-operated adding machines the results of the count is known almost as soon as the last returns are in. This is the most simple part of the work. The analysis of the work, however, is a task that requires years, in fact the 1910 census is not completed yet.

The Mint Exhibition is no doubt the leader of the government exhibits in point of attendance. A section of the Philadelphia Mint is here seen, and the whole process of coin production, from the melting pot to the stamping and weighing machines is in operation, only instead of producing actual coins the machines are turning out souvenirs of the exposition.

The Mint exhibit includes a collection of gold, silver and bronze, showing the metals first in ingot form, then in strips, and finally in the disc. The sand blast method of putting a velvet finish on metals is demonstrated as well as the electrolytic method of refining precious metals.

An Electrically Operated Garage and Test Track

The automobile track and electric garage on the third floor is conducted as in the past under the auspices of the New York Electric Vehicle Association. The garage shows the latest developments in machinery for the care of electrics. On the board track is afforded the only opportunity for an indoor demonstration of automobiles in the city. A series of electric vehicle mileage tests has been arranged for on the track, which measure ten laps to the mile.

Commercial Car and Battery Exhibits

In the commercial and industrial exhibits are included the electric trucks, pleasure cars, storage batteries, etc.

The General Vehicle Company is exhibiting a 1000-lb. worm-drive chassis, fitted with full panel body, also a two-ton chassis, upon which is mounted an especially designed body for the delivery of Sunshine Biscuits. On the automobile track on the third floor this company is demonstrating a two-ton chassis without body.

The Ward Motor Vehicle Company features a 750-lb. delivery car called the "Ward Special" and which is designed to meet the demands of the local tradesman. The exhibit also includes a 2000-lb. express, with wood-covered top, a 1250-lb. panel body job, and a five-ton stake body job.

The Commercial Truck Company of America, is exhibiting a 1000-lb. panel-body truck, featuring a two-motor drive, rear axle construction, which eliminates the differential, and it is claimed, permits driving in twelve inches of snow. This company is also showing a 1000-lb. worm-driven job.

The Edison Storage Battery Company exhibits the Edison Alkaline Storage Battery in various types, ranging from the very small cells used in miners' safety lamps to large 450 ampere hour batteries for the equipment of brewery trucks, railway tractors, interurban cars, etc. A feature of the exhibit is a large panel upon which is mounted a metallic sheet of alternating layers of nickel and copper, attention being called to the thickness of the layers. Each nickel layer is .00004 of an inch and each copper layer .00002 of an inch. Fifty layers of copper would be required to equal a thickness of tissue paper .001 of an inch thick.

The Electric Storage Battery Company is exhibiting various types of battery plates such as are used in central service station work, and storage batteries for trucks and commercial vehicles. One of the features of the exhibit is a complete lighting and starting outfit connected with an Exide cell. The outfit is put through a complete cycle of operations to demonstrate its ability to deliver current for lighting and starting The current consumed is recorded by an ammeter. Large colored, photographic transparencies of vehicles in various lines of business attract much attention, and with the proper battery placed directly beneath them, show at a glance the proper types of battery to use for the vehicle in question. This company's line of batteries, "Ironclad-Exide," "Exide," "Thin-Exide" and "Hycap-Exide" are all shown in disassembled form.

Philadelphia Storage Battery Company. This company is featuring its Diamond Grip, Thin-Plate Battery, which it has specialized during recent years. All types of batteries for truck service, lighting, starting and ignition systems are on exhibition. The parts which make up the cells as well as sectional views of the assembled cells are shown, so that the interior construction may be seen.

The Gould Storage Battery Company is well represented and like the other battery concerns is showing a complete line of its product, including batteries for truck and pleasure cars starting and lighting systems, railroads and central station work. A display feature of the exhibit is a large panel upon which the trade-name Gould is made up of positive and negative battery plates.

The New York Edison Company is extensively represented at this exposition and has spared no pains in making clear to the public and the engineer the wonderful advances made in the field. This concern furnishes nearly 150,000 customers in the Borough of Manhattan and the Bronx with electric light and power.

The United Electric Light and Power Company is another New York company that furnishes light throughout Manhattan Borough. A working model of this company's new generating station at 201st Street and the Harlem River is a striking feature of its exhibit.

ELECTRIC VEHICLE USERS IN MANHATTAN AND BRONX

Editor's note:—The following list was compiled by the New York Edison Company, together with other statistical information in its district. Such data is of value to the electrical industry, and its interests could be furthered if other companies would do likewise in their territories.

Number of Trucks.	Name of Firm.	Address
5	Acker, Merrall & Condit,	185 West 42nd St.
2	Acme Electric Garage,	410 East 32nd St.
52	Adams Express Co.,	242 West 47th St.
4	Aitken, Son & Co.,	417 Fifth Ave.
22	Altman & Co.,	361 Fifth Ave.
1	American Bank Note Co.,	70 Broad St.
3	American Distilled Water Co.,	406 East 53rd St.
107	American Express Co.,	65 Broadway.
1	American Hard Rubber Co.,	11 Mercer St.
3	American Meter Co.,	561 West 47th St.
1	American Museum of Natural History,	77th St. and Central Park West.
1	American Society for the Prevention of Cruelty to Animals,	Madison Ave. and 26th St.
1	Ammann & Co.,	155 Ave. "D."
8	Anheuser Busch Agency,	425 Eleventh Ave.
1	Animated Advertising Co.,	1210 Dorchester Ave., Dorchester, Mass.
13	Arnold Constable & Co.,	Broadway and 19th St.
1	Assenbach, F. H.,	1860 Park Ave.
1	Atlas Safe & Machinery Trucking Co.,	373 Broadway.
2	Audubon Stg. Warehouse,	1926 Amsterdam Ave.
1	Ault & Wiborg Co.,	57 Greene St.
1	Baker Vehicle Co.,	1790 Broadway.
1	Barnett Bros.,	289 Columbus Ave.
18	Beadleston & Woerz,	150 Charles St., and 291 W. 10th St.
1	Becker Bros.,	2692 Third Ave.
1	Bedin & Co., Albert G.,	13-15 W. 20th St.
5	Bellevue Hospital,	26th St. and E. River.
2	Bendel, Henri,	10-12 W. 57th St.
1	Berger Mfg. Co.,	154 Eleventh Ave.
1	Berlin & Jones Envelope Co.,	547 W. 27th St.
10	Bernheimer & Schwarz Co.,	128th St. & Amsterdam Ave.
9	Best & Co.,	5th Ave. and 35th St.
1	Bishop Gutta Percha Co.,	420 East 25th St.
3	Black Starr & Frost,	594 Fifth Ave.
2	Block Bros.,	575 Ninth Ave.
1	Bloomingdale Bros.,	3rd Ave. and 59th St.
5	Blumers & Bros., J.,	539 East 75th St.
9	Boettger, Henry W.,	137 Madison Ave.
5	Bonwit, Teller Co.,	5th Ave. and 38th St.
2	Bordens Milk Co.,	108 Hudson St.
1	Boyertown Burial Casket Co.,	109 West 24th St.
1	Brooklyn Delivery Co.,	207 Thompson St.
2	Brooks Bros.,	Broadway and 22nd St.
6	Brown & Co., S. S.,	105 1st St.
2	Burke, E. & J.,	616 West 64th St.
3	Burns Bros.,	30 Church St.
1	Caldwell & Co., E. F.,	36 West 15th St.
4	Callen, Edw.,	2211 Third Ave.
39	Central Brewing Co.,	68th St. and E. R.
2	Central Consumers Wine & Liquor Co.,	507 West 26th St.
1	Central Union Gas Co.,	138th St. and Locust Ave.
2	Charity Organization Society,	516 West 28th St.
3	Childs Co.,	200 Fifth Ave.
11	Claflin & Co., H. B.,	224 Church St.
1	Clarke's Sons, David,	2139 Broadway.
5	Clausen Flanagan Brewery,	441 West 25th St.
2	Coca-Cola Bottling Works,	339 E. 46th St.
2	Coca-Cola Company,	330 W. 27th St.
4	Columbia Storage Warehouse,	149 Columbus Ave.
31	Consolidated Gas Co.,	124 E 15th St.
1	Corn Exchange Bank,	13 William St.
1	Craske Co., Charles,	441 Pearl St.
11	Cushman, S.,	517 West 59th St.
2	Cushman, L. A. (Bread Co.),	32 Lawrence St.
4	Cushman Globe Co.,	415 Amsterdam Ave.
2	Cammeyer Co.,	310 Sixth Ave.
1	Dakota Stables Co.,	200 West 77th St.
1	Danieli, G.,	2046 First Ave.
1	Deerfoot Farms,	172 Chambers St.
1	Deering, Milliken & Co.,	79 Leonard St.
1	De La Vergne Machine Co.,	Foot E 138th St.
1	Dix & Sons Co., Henry A.,	116 W. 14th St.
36	Doelger, Peter,	407 E. 55th St.
2	Dupont De Nemours Powder Co., E. F.,	90 West St.
1	Eagle Printing Ink Co.,	24 Cliff St.
13	Ehling Brewing Co.,	760 St. Anns Ave.
96	Ehret, Geo.,	235 E. 92nd St.
6	Eichler Brewing Co., John,	3582 Third Ave.
3	Electo Coach Corporation,	30 Church St.
5	Elias Brewing Co., Henry,	403 E. 54th St.
1	Evans & Sons, C. H.,	12th Ave. and 35th St.
2	Everard, James,	12 E. 133rd St.
2	Evers Rehm Co.,	419 E. 24th St.
1	Ewing, Bacon & Henry,	30 Church St.
1	Exide Battery Depots, Inc.,	141 E. 25th St.
1	Federal Printing Co.,	231-9 West 39th St.
2	Fireproof Products Co.,	257 E. 133rd St.
1	Firestone Tire & Rubber Co.,	1871 Broadway.
2	Fish, George F.,	408 W. 14th St.
35	Fleischmann Co.,	142 Perry St.
1	Franco American Baking Co.,	509 W. 38th St.
1	Franklin & Walsh,	1646 Amsterdam Ave.
2	Gates & Co., Church E.,	227 Mott Ave.
12	General Baking Co.,	532 E. 81st St.
1	General Electric Co.,	30 Church St.
2	General Motors Co.,	236 West 59th St.
1	General Vehicle Co.,	30 E. 42nd St.
2	Gidding & Co., J. M.,	564 Fifth Ave.
85	Gimbel Bros.,	Broadway and 33rd St.
1	Glauber, S. S.,	242 E. 79th St.
1	Globe Storage & Cleaning Co.,	305 E. 61st St.
1	Globe Wernicke Co.,	380 Broadway.
4	Goldenberg Brothers,	109 Fifth Ave.
2	Goodman & Son, A.,	634 E. 17th St.
17	Gorham Co.,	5th Ave. and 36th St.
1	Gould Storage Battery Co.,	30 E. 42nd St.
2	Gouverneur Hospital,	Gouverneur Slip.
8	Green Car Sight Seeing Co.,	958 Broadway.
17	Greenhut & Co., J. B.,	6th Ave and 18th St.
7	Grohs Sons, M.,	238 W. 28th St.
1	Gurkin, George,	603 W. 42nd St.
2	Gutfreunds Olympia Market,	619 Ninth Ave.
6	Hammacher, Schlemmer Co.,	133 4th Ave.
2	Handrich, Fritz & Sons,	309 E. 56th St.
1	Harlem Hospital,	136th St. and Lenox Ave.
1	Hart, P. A., Woodlawn Cemetery.	
1	Hauber, Frank J.,	622 W. 130th St.
2	Haupt Co., Inc., Mathew,	615 W. 129th St.
1	Healey & Co.,	1654 Broadway.
35	Hearn, James A.,	20 W. 14th St.
2	Heide, Henry,	313 Hudson St.
4	Heinz, H. J.,	256 West St.
1	Helmus Paper Co.,	99 Mott St.
1	Hencken, Henry,	543 W. 28th St.
1	Hobson, William,	571 W. 181st St.
9	Hoffman Brewing Co.,	211 E. 55th St.
4	Hollender, Fred,	123 Lafayette St.
4	Horn & Hardart,	600 W. 50th St.
8	Hupfel Brewing Co.,	229 E. 38th St.
2	Hyde & Sons, A. G.,	361 Broadway.
1	Irene, Madam,	518 Fifth Ave.
1	Jaeckel & Co., A.,	384 Fifth Ave.
1	Jaeckel & Sons, H.,	16 W. 32nd St.
1	Johnson & Co., C. E.,	410 Pearl St.
1	Keeper, Geo. D.,	435 W. 21st St.
2	Kindermann & Sons, Julius,	1360 Webster Ave.
4	Kips Bay Brewing Co.,	650 First Ave.
3	Knox Retail Hat Co.,	452 Fifth Ave.
1	Krakauer, Jacques,	18 W. 85th St.
1	Kurzman's Sons,	385 Fifth Ave.
1	Lamb Finley Co.,	256 Church St.
1	Leggett & Co., Francis H.,	220-234 13th Ave.
1	Leggett & Myers Tobacco Co.,	212 Fifth Ave.
1	Lewandos Dye & Cleaning Co.,	557 Fifth Ave.
2	Liberty Storage & Warehouse Co.,	43 W. 64th St.
2	Lichtenstein Millinery Co.,	538 Fifth Ave.
1	Lincoln Hospital,	320 Concord Ave.
8	Lincoln Safe Deposit Co.,	60 E. 42nd St.
4	Lindenmyer, Henry,	36 Bleecker St.
11	Lion Brewery,	108th St. and Col. Ave.
14	Loewer's, Gambrimus Brewing Co.,	528 W. 42nd St.
45	Lord & Taylor,	5th Ave. and 38th St.
3	Luchow, August,	110 E. 14th St.
1	Luhring, Fred,	611 E. 12th St.
1	McCabe, Hanger Mfg. Co.,	425 W. 25th St.
2	McCreery & Co., James,	9 W. 34th St.
4	McCutcheon & Co., James,	345 Fifth Ave.
33	Macy & Co., R. H.,	Broadway and 34th St.
4	Maillard, Henry,	116 W. 25th St.
1	Maison de Blanc,	308 Fifth Ave.
1	Mallory Steamship Co.,	Pier 37, N. R.
1	Manhattan State Hospital,	Ward's Island.
5	Manhattan Storage & Warehouse Co.,	801 Seventh Ave.
1	Mapes & Co., Winfield H.,	17 Harrison St.
1	Marseillaise French Baking Co., The,	293 W. 4th St.
1	Mau, Charles F.,	431 E. 150th St.
1	Merck & Co.,	45 Park Place.
1	Merritt, Stephen,	Embalming Co., 241 W. 23rd St
1	Metropolitan Dye Works,	180th St. and Bronx River.
2	Metropolitan Opera Co.,	Broadway and 39th St.
1	Meyer & Martin,	118 E. 88th St.
1	Meyer & Peter,	2196 Broadway.
1	Miles, Wm. A.,	300 Cherry St.
1	Mills & Gibb,	286 Fourth Ave.
1	Mirror, The,	431 Hudson St.
1	Monahan Express Co.,	216 W. 18th St.
1	Morrell & Co., John,	620 W. 36th St.
22	Motor Delivery Co.,	42 Downing St.
1	Mount Sinai Hospital,	Madison Ave. and 100th St.
1	Mitchell Co., P. R.,	36 E. 20th St.
1	Metropolitan Storage Warehouse,	39 W. 66th St.
1	Nathan Manufacturing Co.,	101 Park Ave.
11	National Express Co.,	141 Broadway.
5	National Fire Proofing Co.,	453-5 W. 17th St.
2	Neumer, Inc., Ferd,	155 W. 20th St.
3	New Amsterdam Gas Co.,	130 E. 15th St.
1	Newcomb, E. J., Mfg.,	44 W. 13th St.
1	N. Y. & Brooklyn Casket Co.,	27 Great Jones St.
1	N. Y. Butchers' Calfskin Assn.,	407 E. 47th St.
11	N. Y. Butchers' Dressed Meat Co.,	495 11th Ave.
1	N. Y. C. & H. R. R.,	Grand Central Station.
127	N. Y. Edison Co.,	Irving Place & 15th St.
8	N. Y. Hospital,	7 W. 15th St.
1	N. Y. Motor 'Bus Co., Inc.,	1 Wall St.
2	N. Y. Mutual Gas Light Co.,	36 Union Sq.
1	N. Y. Piano Del. Co.,	2 E. 39th St.
2	N. Y. Public Library,	42nd St. and 5th Ave.
30	N. Y. Railways Co.,	165 Broadway.
1	N. Y. Railway Time Table Co.,	23 E. 26th St.
10	N. Y. Transfer Co.,	1354 Broadway.
2	Northern Union Gas Co.,	1815 Webster Ave.
1	Obry, Madam,	5 E. 45th St.
1	Ohl, Philip,	846 Amsterdam Ave.
2	Ohmeis & Co., P. M.,	540 Greenwich St.
1	Old Globe Laundry,	9 Barrow St.
1	O'Meara, Maurice,	446 Pearl St.
1	O'Neill Adams Co.,	335-7 Sixth Ave.
1	Ovington Bros.,	314 Fifth Ave.
1	Park & Tilford,	522 W. 42nd St.
1	Pennsylvania R. R. Co.,	Penna. Sta., 32nd St. and 8th Ave.
2	Percival, Charles,	100 Sixth Ave.
3	Pettit & Reed,	38 N. Moore St.
1	Phillips & Sons, M.,	829 E. 134th St.
1	Picker Bros.,	315 W. 125th St.
8	Piercy & Co., Z. T.,	207 Thompson St.
42	Piercy Contracting Co.,	422 W. 15th St.
1	Pine Hill Crystal Spring Water Co.,	465 Tenth Ave.
4	Pittsburgh Plate Glass Co.,	322 Hudson St.
1	Police Department,	240 Centre St.
20	Postal Transfer Service, Inc.,	42nd St. and First Ave.
1	Proctor, F. F., Jr.,	1493 Broadway.
6	Ringler & Co., Geo.,	203 E. 92nd St.
1	Rockefeller Institute Hospital,	Ave. A and 66th St.
3	Rohe & Bros.,	527 W. 36th St.
1	Roth & Hammel,	150 Amsterdam Ave.
2	Rouss, C. B.,	555 Broadway.
2	Runkel Bros.,	431 W. 30th St.
113	Ruppert, Jacob,	1639 Third Ave.
1	Rogers & Co., C. P.,	517 W. 29th St.
1	Safety Amorite Conduit Co.,	Franklin and Hudson Sts.
2	Salvation Army, The,	535 W. 48th St.
1	Sarasohn & Son,	187 E. Broadway.
12	Schaefer Brewing Co., F. & M.,	107 E. 51st St.
1	Schanz, Joseph,	18 W. 30th St.
1	Schnur & Co., B. H.,	43 E. 12th St.
1	Scholtz, Theodore,	429 W. 16th St.
1	Security Bank,	1 E. 14th St.
4	Seeley's Sons, Inc., G. B.,	319 W. 15th St.
1	Seitz Co., Inc., W. E.,	417 E. 90th St.
1	Sherman & Sons Co.,	381 Fourth Ave.
1	Shoninger Bros.,	900 Broadway.
2	Sills' Sons, J. S.,	604 W. 37th St.
7	Silz, August,	416 W. 14th St.
10	Simon & Co., Franklin,	414 Fifth Ave.
18	Simpson Crawford Co.,	307 Sixth Ave.
2	Singer Sewing Machine Co.,	120 W. 50th St.
1	Slater, Inc., J. & J.,	1121 Broadway.
4	Sloane, W. & J.,	Fifth Ave. and 47th St.
1	Smith & Kaufman,	549 West 132nd St.
6	Smith & Co., C. L.,	544 W. 30th St.
2	Sprague Electric Co.,	527 W. 34th St.
6	Stahl, Otto,	2332 Third Ave.
1	Standard Gas Light Co.,	1328 Broadway.
1	Starr & Co., Theo. B.,	578 Fifth Ave.
6	Steinway & Sons,	109 E. 14th St.
1	Stern & Stern,	79 Fifth Ave.
24	Stern Bros.,	146 W. 30th St.
5	Stevenson Brewing Co., David,	521 Tenth Ave.
1	Storage Battery Supply Co.,	239 E. 27th St.
2	Nathan Strauss Pasteurized Milk Laboratory,	348 E. 32nd St.
1	Stumpp, G. M.,	761 Fifth Ave.
14	Sulzberger & Sons,	406 E. 47th St.
11	Third Avenue Ry. Co.,	2396 Third Ave.
1	Thompson Co., John R.,	1259 Broadway.
1	Thurn, Madam,	426 Fifth Ave.
21	Tiffany & Co.,	Fifth Ave. and 37th St.
2	Tiffany Studios,	347 Madison Ave.
2	Toch, H. M. & M.,	320 Fifth Ave.
4	Tower Mfg. & Novelty Co.,	306 Broadway.
1	Turin Garage & Supply Co.,	53-5 W. 93rd St.
1	Union Railway Co.,	2396 Third Ave.
5	United Cigar Stores Co.,	44 W. 18th St.
22	United Dressed Beef Co.,	44th St. and First Ave.
27	United Electric Light & Power Co.,	130 E. 15th St.
1	United Wine & Trading Co.,	321 W. 13th St.
1	Van Buren & New York Bill Posting Co.,	515 Seventh Ave.
6	Vantine & Co., A. A.,	877 Broadway.
2	Walker Vehicle Co.,	30 Church St.
2	Wall Rope Co.,	48 South St.
1	Walsh, David,	72 Warren St.
2	Wanamaker, John,	Broadway and 10th St.
130	Ward Bread Co.,	Concord Ave. and E. 143rd St.
2	Ward Motor Vehicle Co.,	Concord Ave. and 143rd St.
4	Webber, Richard,	2191 Third Ave.
2	Weber, Jules,	236 W. 40th St.
1	Wemple Co., J. C.,	35 E. 20th St.
31	Westcott Express Co.,	46th St. and Madison Ave.
3	West End Storage Warehouse,	210 W. 89th St.
1	Wetterau & Co., H. C.,	286 Greenwich St.
1	White, Frank C.,	15 Catherine St.
1	Wilkinson Bros.,	2500 Eighth Ave.
2	Williams & Co., R. C.,	56 Hudson St.
2	Williams & Sons, I. T.,	222 Eleventh Ave.
3	Williams Printing Co.,	437 Eleventh Ave.
1	Wisconsin Cond. Milk Co.,	91 Hudson St.
4	Zampieri Bros.,	17 Cornelia St.

Electric Trucks Produce Most Economical Delivery

Experience of Manager of Deliveries of Broadway Department Store, Los Angeles, in Improving Service and Producing Low Costs

By FRANK H. REED

AN EXACT record of the daily performance and cost of each of its trucks in its composite fleet of electric and gasolene cars, with weekly and monthly summaries, enables Albert E. Amos, in charge of deliveries of the Broadway Department Store, Los Angeles, to have exact and detailed knowledge of the service supplied. Mr. Amos' experience with electrics in department store delivery work, in which he has been engaged for 10 years, leads him to make the positive statement that "There is no question but the electric truck supplies the cheapest and most satisfactory mode of handling department store deliveries in the country to-day." There are just two conditions in which the Broadway Store finds that the gasolene cars give superior service. One of these is in handling outlying points where a gasolene car runs out from the store and covers on one route a considerable number of suburban and adjacent towns, averaging close to a hundred miles a day. The other condition is in the Edendale hills, where a light gasolene car is used, these hills, undoubtedly the worst in any city in the country, being impracticable for an electric car, although electrics provided with adequate motor and battery will negotiate any other bad hills in town. The electric is superior on all close-in work.

The company is operating three Urban 1000-lb. and one one-ton electrics, one purchased March 20, 1913, and three purchased November 14, 1913. At present they are all used on city delivery. The maximum straight-line distance from the store reached on any route is 5½ miles. Last spring a demonstration, which was satisfactory for the car, was given, handling deliveries in two neighboring adjacent towns, Tropico and Glendale, distant from the store 6 and 8 miles respectively. The electric performed service on this route every day for 3 months, and did not have to be relieved for repairs or any other reason in that period. The route was handled by the car and one man, replacing a man and four horses, which had been worked two one day and two the next, alternating. On this service the car averaged 38 miles a day, in bad country, where the man who was to drive the car had said, before putting it on the route, that it would not last a week. The driver at the time of starting favored the gasolene car on account of speed, but on actually trying it out, he found that he could handle the route and be back in town by 2 p.m. to 3 p.m., as against 5 p.m. with horses. This truck was ordered at a time when the company was handling groceries, delivering ½ ton a day on this route, but it gave up the grocery business by the time the truck was put in service, so the one-ton truck never had over an 800-lb. load, and after 3 months was taken off the route, to use for furniture and heavy hauling. In its first month on this route, January, 1914, the car made 1170 miles at a total cost for the driver, garaging and repairs, of $120, this figure not including a depreciation charge. It made 1907 stops, average distance per stop ½ mile, average cost per stop 6 cents, average cost per mile 10 cents.

Electric Saves Cost of Its Own Driver and Electricity Over Horse Hauling

February was a bad month on account of washouts and bad road conditions, but the car was kept on the job and handled all

One-Ton Urban Electric Car Loaded Night December 20, 1913, for Delivery Monday, December 22d

Made 54 miles, 255 stops. Crew, one man and one boy. Started 7 a. m., back before 5.30; after which charged and loaded for next morning's deliveries. Delivery manager says wire bodies use less current than closed bodies.

business done in the district. This was a light business month, and the truck ran 849 miles, making 1026 stops, average distance per stop 4/5 of a mile, cost for the month $105. The superintendent of deliveries figures that comparison of the monthly cost of this electric with expenses under horse conditions, where each of the four horses cost $23.50 per month for keep, not including veterinary attendance or repairs to harness or wagon, shows that the use of the electric gives a saving just about equal to the cost of the driver and the electricity for running it.

Taking more recent conditions, including city routes, in August, 1914, No. 63, 1000-lb. car, bought November 14, 1913, running all week-days made 1079 miles, 2363 stops, driver's salary $65, car expense $83.55, including garaging, electricity, oil, washing, repairs, etc., but not depreciation: $10.55 was for repairs on account of a broken steering knuckle and $38 for a new tire. The record for the entire year 1914 to date for No. 65 1000-lb. electric bought November 14, 1913, shows following cost, not including salary of driver or depreciation: Besides the garage expense the record shows no charge for repairs in January; $2.20 for repairs in February; $2.20 for repairs in March; $3.10 for repairs in April; $4.05 for repairs in May; $3 for repairs in June; $7.30 for repairs in July, this including a broken spring; and $4.10 for repairs in August. Low garage expenses are due in part to the low rates for current made possible by the use of hydro-electric power. This car was used in the city on level ground. The first time one of these trucks was worked in the hills it burned out an armature. Manufacturers are able, however, to provide extra battery and motor capacity to take care of most hill conditions. It is simply a question of taking these matters into consideration in specifying the truck.

Deliveries at Direct Cost of Four and One-third Cents Per Stop

The performance of No. 65 car is indicated by its August record. In this month it handled 2460 stops at a cost of 4⅓ cents per stop; mileage, 1254, ½ mile per stop, 9 cents per mile. Total cost, including crew, one man driving and making deliveries, $107.30.

Comparison With Previous Horse Service

A line on the performance of gasoline cars out of town is given by record of one and a half ton Autocar which has been in service 3 years and 10 months. For

Fleet of 1 One-Ton and 3 One Thousand Pound Urban Electrics of Broadway Department Store, Los Angeles

Loaded December 20, 1913, for deliveries Monday, December 22d. One-ton truck performance as noted under other illustration. Others averaged 165 stops, all back by 3 p.m., for another load. Crew each car, one man and one boy.

the week ending September 12th this car made 503 miles, 690 stops with a crew of two men; total expense, $56.10, including salary of crew, which is 8 cents a stop. Mr. Amos figures that 50 miles per day is about as much as he should expect from an electric. On this basis one 1000-lb. electric performs service surperior to that of one wagon and four horses, using two horses every other day. From their actual experience in replacing horses with the electric they replaced five men, five wagons, and nine horses, four with two horses, one with one horse, with three 1000-lb. electric trucks and three men.

As a matter of fact, this service required the company to own ten horses, working nine and keeping one in reserve. The electrics give better service, as each electric covers the entire district each day and it is not necessary to have a 2 p.m. limit. Furthermore, the electrics are now delivering from 500 to 800 more stops and correspondingly more packages per month than the horses did, by covering bigger districts. In other words, the company has extended its districts and is also taking care of the additional business due to increasing density of population and increase in its own business in each district in addition to giving better service.

Statistics Show Increase of Electrics and Average Operating Costs

At an immense expenditure of time and trouble, the New York Edison Company has compiled two charts, herewith reproduced, one showing the business available and obtained, the other giving costs, etc.

The first chart indicates that several companies have enjoyed substantial increases and it is firmly believed by the conservative and well-balanced electric vehicle supporter that increases must continue and multiply. This chart may serve a number of purposes. It indicates that such performance and cost data is available and may be obtained for the use of Central Station solicitors and electric vehicle salesmen. While it has been contended at times, that operating costs may be of little real value to the prospective purchaser, the fact remains that such data is constantly demanded of the salesmen by the prospective purchaser, and lack of real data has ofttimes weakened the electric vehicle argument. If for no other reason, the moral effect upon the customer is good when he is made to realize that he is discussing the subject with a man who has made a thorough study of conditions and requirements, and has compiled such data as to make him conversant with what performance may be expected under varying conditions.

In compiling the cost data there has been discovered a regrettable absence of common method of record keeping, making comparisons difficult. In very few cases is found charged such items as rent, administration, supervision, etc., and then again it is developed that seldom is distinction made between expenditures for parts and for labor. It might be supposed that these items could be entirely excluded from an electric vehicle cost sheet, but experiments in this direction have developed cases where garage expenses, such as labor and supplies, are included in rental.

It is found that interest charges on investment vary from 3 to 6 per cent. While the 6 per cent. charge is perhaps well understood, it may be proper to mention that the 3 per cent. charge is used where the owner is convinced that the initial value of his car is constantly decreasing, and that if 10 per cent. depreciation is charged, it will wipe itself off the books in 10 years.

Depreciation is a variable item ranging anywhere from 8 per cent. to, in one case, 19 per cent. per annum during the life of the vehicle, with no good reason for the charge exceeding 10 per cent. The depreciation, or amortization, items in the chart are all figured on the first cost of the vehicle complete. The company is of the opinion however, that it is quite proper to compute depreciation on the cost of the truck less tires and battery, inasmuch as there is an annual repair and renewal cost charged to both of these accessories.

Examining chauffeur costs shows that in some cases the practice is to charge part of the man's time to the particular job on

PERFORMANCE DATA											OPERATING EXPENSE											
											OIL		CURRENT		TIRES		BATTERY		MECHANICAL PARTS		REPAIRS LABOR	
RATED CARRYING CAPACITY	TYPE OF BATTERY	PERIOD COVERED BY DATA	TOTAL MILEAGE	TOTAL K.W HOURS USED	K.W HRS PER VEHICLE MILE	COST CURRENT PER K.W.HR	DAYS USED	% TOTAL WORKING TIME USED	CLASS OF SERVICE	AVE. % GRADES	YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE
700	Lead	1 Yr.	5518	3224	.585	.0300	280	89	Distribution & Construction	4%	4.35	.0008	96.72	.0175	24.38	.0044			500.83	.0909	203.63	.0369
700	Lead & Edison	5 Yrs	17335.5	10074	.581	.0400	895	80.6	Delivery	2%	4.47	.0008	268.64	.0465	60.46	.0105	119.86	.0215	79.43	.0138	17.17	.0030
1000	Lead	2 Yrs.	419510	257685	.6140	.0335	670	92	Mail Delivery	2%	205.44	.0010	4316.21	.0206	2055.47	.0098	6053.01	.0289	4438.05	.0212	1913.46	.0091
1000	Lead	1 Yr.	10097	7397	.733	.0300	279	89	Distribution and Construction	4%	9.30	.0005	221.91	.0220	274.44	.0272			465.04	.0461	427.72	.0424
1000	Lead & Edison	3½ Yrs	62312	31737	.509	.0400	1046	81.9	Delivery	2%	10.25	.0006	362.71	.0207	145.09	.0081	747.96	.0420	230.93	.0130	77.37	.0043
2000	Lead	2 Yrs.	134161	82408	.615	.0335	670	92	Mail Delivery	2%	65.17	.0009	1380.33	.0207	958.80	.0143	1915.68	.0286	1227.95	.0183	572.86	.0085
2000	Lead	1 Yr.	9691	7110	.818	.0300	234	75	Distribution and Construction	4%	9.08	.0010	213.30	.0245	33.62	.0039			91.64	.0105	316.99	.0365
2000	Lead	6 Mos.	50773	18918	.617	.0300	164	100	Pick-up and Delivery	2%	6.36	.0001	1135.98	.0185	1823.26	.0297	686.20	.0112	571.88	.0093	745.58	.0121
2000	Lead & Edison	3½ Yrs	44307	35994	.815	.0400	1186	92.9	Inspection & Emergency	2%	7.98	.0006	411.36	.0327	166.52	.0132	595.00	.0470	86.22	.0068	104.66	.0083
3000	Lead	1 Yr.	6192	4866	.788	.0300	240	96	Delivery		3.96	.0006	145.98	.0236	198.12	.0320	200.28	.0324	141.00	.0227		
4000	Lead	2 Yrs.	71802	61763	.860	.0335	670	92	Mail Delivery	2%	39.89	.0011	1034.53	.0288	755.69	.0210	1353.75	.0377	729.55	.0203	357.33	.0099
4000	Lead	1 Yr.	4553	4507	.898	.0300	246	98	Delivery		3.00	.0006	135.21	.0297	196.44	.0432	309.48	.0680	99.72	.0219		
4000	Edison	1 Yr.	5817	6950	1.195	.0300	240	96	Trucking		2.64	.0004	208.51	.0358	152.76	.0263	37.92	.0065	66.24	.0114		
4000	Lead & Edison	3½ Yrs	27653	26816	.970	.0400	1080	83.5	Delivery	2%	5.06	.0006	306.47	.0388	289.11	.0365	251.28	.0318	92.02	.0117	66.44	.0084
7000	Lead	1 Yr.	7729	10290	1.298	.0100	299	96	Heat Delivery		3.63	.0005	97.54	.0121	254.46	.0329	259.45	.0336	446.74	.0578		
7000	Lead	3½ Yrs	10591	12688	1.197	.0400	1070	83.8	Trucking and Cable Pulling	2%	2.78	.0009	114.95	.0479	123.15	.0407	266.94	.0882	19.02	.0063	13.43	.0044
10000	Lead	1 Yr.	5891	6925	1.175	.0300	248	97	Heavy Trucking		3.00	.0005	207.75	.0353	193.44	.0328	221.52	.0376	97.36	.0165		
10000	Lead	3½ Yrs	11058	15529	1.406	.0400	1069	83.4	Trucking & Cable Pulling	2%	2.90	.0009	178.90	.0569	162.28	.0577	315.81	.1000	20.99	.0067	12.80	.0041

Electric Vehicle Operating Cost Chart

Name of Company	Electrics Operating in Territory		Electrics Charged-Central Station Service		Per Cent of Total No. of Electrics on Central Station Service		Charging Current Sold Kilowatt Hours		Average Rate per Kilowatt Hour	
	1912	1913	1912	1913	1912	1913	1912	1913	1912	1913
United Electric Lt. & Pwr. Co			104	124			286,113	537,678	3.409	3.48
Public Service Electric Co.	422	472	352	400	95	88	644,500	1,043,500	3.65	3.37
Edison Electric Illuminating Company of Boston	327	463	311	447	95	96	774,202	1,351,965	3.61	2.83
Potomac Electric Power Co.	758	950	678	860	91	91	1,470,443	1,927,730	3.62	3.54
Commonwealth Edison Co.	2,135	2,829	1,155	2,070	54	73	3,000,000	6,500,000	4.33	3.08
The New York Edison Company	1,640	2,070	815	1,100	50	53	3,890,500	5,500,000	4.50	4.21

Chart Showing Growth of Central Station Electric Vehicle Business

which the vehicle may be engaged, while in other cases the entire time is charged to the operation of the vehicle.

It will undoubtedly be realized that there is a crying need for a common accounting system if results are to be compared and presented to the public. This standardization of record keeping might well first be undertaken by the Central Station Companies and passed through the Commercial Departments to the public.

In the meantime it might perhaps be well to simplify and reduce to a minimum the number of cost items which may be discussed with a customer. While the manner in which we find charged such items as depreciation, interest, insurance, rental, etc., are found may depend more or less upon the whim of the accountant, there is always present in undisguised form the costs of charging current, lubricants, battery, tire, and mechanical repairs and renewals. These the company thinks may be considered actual operating costs peculiar to the electric, and will be comparable, if mileage records are kept.

ELECTRIC ECONOMICAL CAR FOR CLOSE-IN, CONCENTRATED DISTRICT

A reduction in the cost per package of city delivery, and improvement in service, has been effected by the Ville de Paris Department Store, Los Angeles, through substitution of electric truck delivery, under its own management, for the services of a package delivery company, which used horses and wagons. At present, the company is using but one electric, a 1000-lb. G. V., purchased December 8, 1913, the balance of its fleet being gas cars. The gas cars are used in the suburban and other districts more remote from the store, and the electric is used in a high-grade resident district, maximum straight line distance 7 miles out from the store.

It makes 50 to 60 miles per day, average, and around 150 daily stops. The electric's cost runs between 6 and 7 cents per stop. The car has been operated with a consistently low record for repairs. Mr. S. B. Jones, in charge of deliveries, thinks the total for repairs since they have owned the truck would be less than $25. They have found the electric is rather slow on hills, some of which occur in the district in which it is used. This is the closest to the store and most thickly populated of any of the delivery districts.

Mr. Jones thinks that an electric must be used in a concentrated district to pay, but in such a district is considerably superior to the gas car. A great advantage is that it cannot be overspeeded, and is fool-proof, as there is no machinery in sight or get-atable for the driver to monkey and experiment with. He does not believe in transferring a man from a gas car to an electric, as the gas car driver seems to like to get more speed out of an electric and is against the car from the start, and not likely to give it a fair show.

FIXED AND OVERHEAD EXPENSE																				TOTALS	
RENT		GARAGE				SUNDRIES		DRIVER		AMORTIZATION		INTEREST		FIRE INS.		LIABILITY INS.		ADMINSTRATION		PER VEHICLE PER YEAR	VEHICLE MILE
YEARLY COST	VEHICLE MILE	SUPERVISION		LABOR		YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE		
		YEARLY COST	VEHICLE MILE	YEARLY COST	VEHICLE MILE																
		89.65	.0162	82.38	.0149	100.81	.0182			150.00	.0272			8.10	.0015	60.75	.0110			1321.60	.2395
315.08	.0545			218.17	.0378			1194.00	.2068	322.33	.0558	96.93	.0168	51.78	.0090	212.47	.0541	49.30	.0085	1505.06	.5211
1421.16	.0067	1254.51	.0060	3055.33	.0146	4111.86	.0196	11708.23	.0558	9788.04	.0466	1601.73	.0076	217.00	.0010	3995.08	.0191	2165.93	.0103	3429.44	.2799
		156.34	.0155	159.76	.0158	204.93	.0203			440.00	.0436			21.60	.0021	121.50	.0120			1251.27	.2478
695.26	.0391			503.57	.0283			2391.43	.1344	880.00	.0495	264.00	.0148	120.57	.0068	459.71	.0264	97.26	.0055	1746.52	.3925
441.36	.0065	368.93	.0055	913.82	.0136	1226.88	.0183	3682.69	.0549	3956.28	.0589	648.06	.0097	86.94	.0013	1175.02	.0175	636.99	.0095	3851.51	.2071
		117.84	.0136	118.77	.0137	157.24	.0182			520.00	.0598			36.00	.0041	121.50	.0140			1397.22	.1909
2395.62	.0390	961.20	.0156	1922.44	.0313	1404.92	.0228	6992.50	.1136	1967.36	.0320	1180.42	.0192	135.00	.0022	850.50	.0139			2531.02	.3705
639.73	.0505			428.00	.0339			2540.71	.2000	876.50	.0693	262.95	.0207	127.76	.0101	331.98	.0262	72.94	.0058	2216.10	.5251
75.00	.0121			91.56	.0148	5.64	.0009	582.68	.0940	270.00	.0436	81.00	.0131	24.30	.0039					1819.52	.2937
391.52	.0109	295.08	.0082	669.42	.0186	899.08	.0251	1993.42	.0555	3657.96	.1018	584.69	.0163	78.71	.0022	939.92	.0262	509.12	.0142	3572.54	.3978
75.00	.0165			116.52	.0256	5.52	.0012	644.16	.1414	350.00	.0769	105.00	.0231	31.50	.0069					2066.15	.4550
75.00	.0129			86.56	.0149	8.16	.0014	581.04	.0999	305.00	.0524	91.50	.0157	27.45	.0047					1642.78	.2826
632.71	.0801			260.28	.0329			1543.57	.1954	799.71	.1012	240.38	.0308	117.52	.0149	234.32	.0297	49.57	.0063	2444.23	.6191
		193.88	.0250	Included with Supervision		88.90	.0115	954.32	.1235	253.24	.0328	139.88	.0181	13.00	.0017	63.09	.0082			2764.12	.3576
378.65	.1251			146.85	.0486			917.14	.3030	455.00	.1505	136.43	.0451	66.17	.0219	114.93	.0380	24.31	.0080	2809.82	.9286
75.00	.0127			116.52	.0198	12.00	.0021	1159.56	.1966	490.00	.0832	147.00	.0250	44.10	.0075					2767.25	.4696
465.91	.1475			146.57	.0464			916.28	.2900	512.00	.1621	153.87	.0487	75.85	.0240	115.77	.0367	24.43	.0052	3104.36	.9835

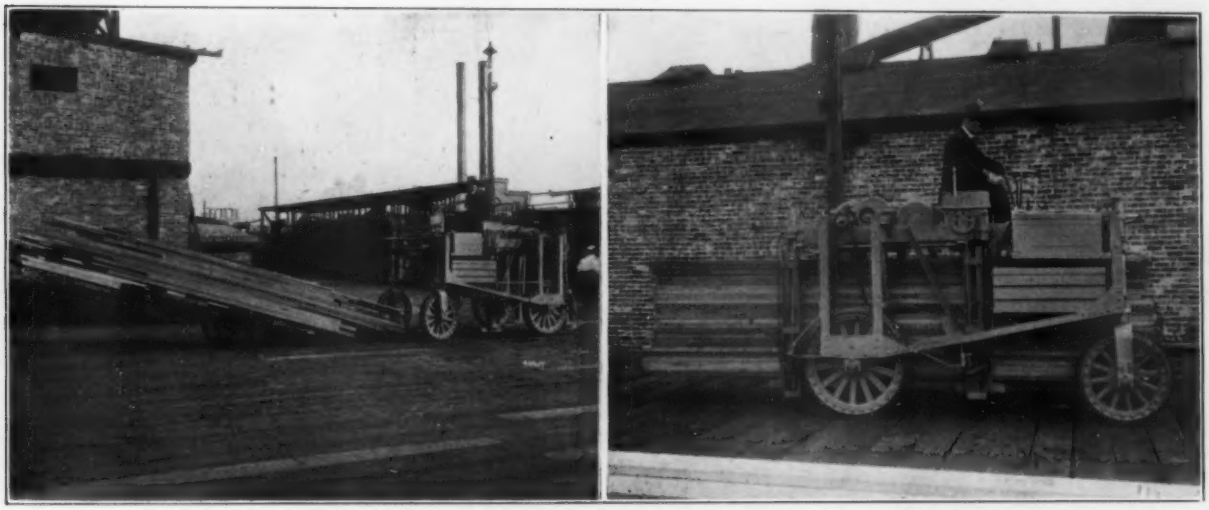
Compiled by the New York Edison Company

A NOVEL ELECTRIC LUMBER TRUCK

The Stetson-Ross Machine Works, of San Francisco, Cal., recently designed a very novel electric truck for hauling lumber. The truck is made entirely of angle irons and I-beams riveted together, the wheels being fitted with solid rubber tires, the truck having springs under the front wheels only.

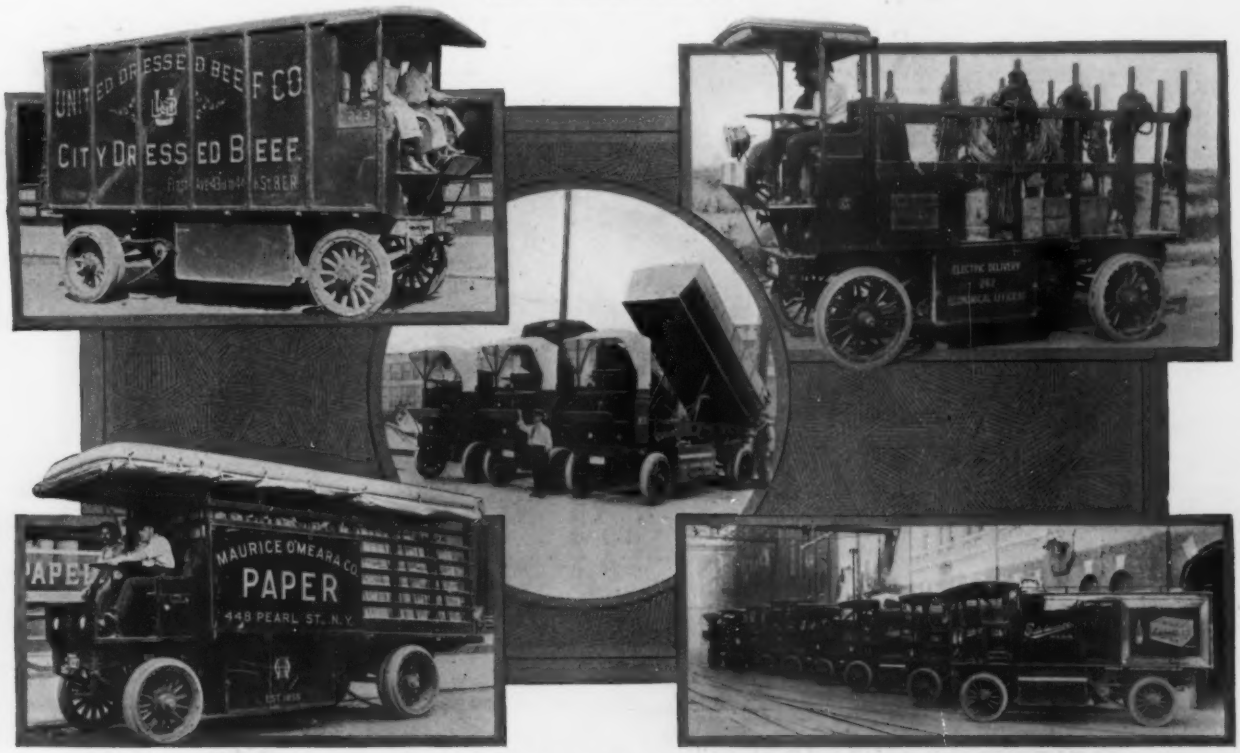
The truck is designed to be driven directly over a pile of lumber which has been previously raised about 6 in. from the ground. By means of a lever on the side of the driver's seat, two side frames, one on each side of the truck, are forced against the pile of lumber and locked into place. These side frames have a double suspension, one behind the back wheel and the other approximately between the two wheels. After the side frames have been locked in place, the driver's clutch is then shifted and the motor is used to hoist the lumber clear of the ground. To unload, the cables are simply released, controlled by a brake, while the pile of lumber is being lowered. The side frames are then brought back to their original position and the truck moves out free from the lumber pile.

This new type of lumber truck is equipped with an "Ironclad-Exide" Battery, manufactured by The Electric Storage Battery Company of Philadelphia.



A Novel Electric Lumber Truck

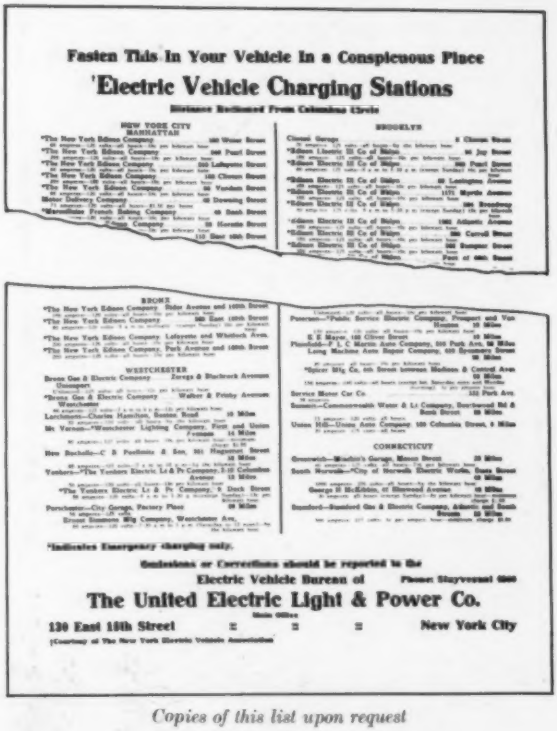
Left shows the truck advancing to drive over the load, which is raised about six inches from the ground. When over the load, the truck grips it, lifts it clear of the platform and carries it off. This is shown in the second illustration



G. V. Electrics in Use in Various Lines of Business

Upper left: one five-ton truck of fleet of twenty-five used by large beef concern. Upper right: a two-ton machine used by New York & Queens Electric Light and Power Company of Long Island City. This company employs nineteen machines of the same type. Lower left: five-tonner used by paper house. Lower right: eight machines used by Schoenhofen Brewing Company, of Chicago, Ill. Center: three five-ton machines fitted with power dumping bodies; used by Commonwealth Ice & Cold Storage Company.

Do You Know That New York's Investment In Electric Vehicles Is Over $7,000,000?



Fasten This In Your Vehicle In a Conspicuous Place

'Electric Vehicle Charging Stations

Distances Reckoned From Columbus Circle

NEW YORK CITY
MANHATTAN

BROOKLYN

BRONX

WESTCHESTER

CONNECTICUT

*Indicates Emergency charging only.

Questions or Corrections should be reported to the
Electric Vehicle Bureau of
The United Electric Light & Power Co.
Main Office
130 East 15th Street New York City
(Courtesy of The New York Electric Vehicle Association)

Copies of this list upon request

There are more than 2300 electric vehicles in New York City—over 45 electric fleets (10 vehicles or more)—over 100 garages and charging stations in the metropolitan district.

The cost of electricity for charging storage batteries is decreasing steadily. (After Nov. 1st the minimum charge will be reduced from $25.00 to $10.00 per month.)

These items of compelling interest must appeal to you!!
Then write to:

ELECTRIC VEHICLE BUREAU

The United Electric Light & Power Co.

GENERAL OFFICES:
130 East Fifteenth Street
'PHONE: STUYVESANT 4980

UNITED

BRANCH OFFICE AND SHOWROOM:
138 Hamilton Place
'PHONE: AUDUBON 4000

New Generating Station:
(One of the largest in the world)
West 201st Street and Ninth Avenue at the Harlem River

A Properly Cooled Motor Is Most Efficient

LONG Cooling Systems

Many of the highest grade motor trucks include Long Cooling Systems in their *regular* equipment because they assure maximum efficiency of the motor at all times under varying conditions. Perfect radiation is guaranteed.

Long Cooling Systems are built *to order*. The requirements of each motor are studied and a cooling system designed that perfectly solves the radiation problem.

Guaranteed to cool properly the motors for which they are built.

Guaranteed to be free from imperfection in Design, Material and Workmanship.

Send for catalogue showing all the types of cooling systems we make, Cellular, Flat Tube Honeycomb, Spiral Tube, Fin and Tube.

We are specialists in the manufacture of cooling systems for every type of motor car, truck or tractor.

LONG Mfg. Co.

Detroit, Mich.

Pioneer Makers of Gasoline Engine Cooling Systems

Stegeman

MANUFACTURING POLICY

Our idea in building trucks is not to build the most—(QUANTITY)—our idea is to get *permanent* satisfied customers and *users*, and there is only one *absolute* way of doing this—

USE THE WORLD'S BEST UNITS—

(Not second best or something nearly as good.) We use Continental motors, Brown-Lipe nickel-steel gears throughout in both transmission and differential, Timken bearings, Eisemann automatic advance magnetos, mangano-silicon springs, chrome-vanadium axle forgings, nickel steel in all bolts and pins plus "STEGEMAN" simplicity and 10 special features of design—each one of which has proved in practice an item of maintenance economy.

Our Users from Coast to Coast are the Country's largest and most prominent buyers.

Write us and have our literature for reference

STEGEMAN MOTOR CAR CO., Milwaukee, Wis.

DeKalb TRUCKS

1½ Ton **2½ Ton**

These Two Great Models Will Solve Your Customers' Problems

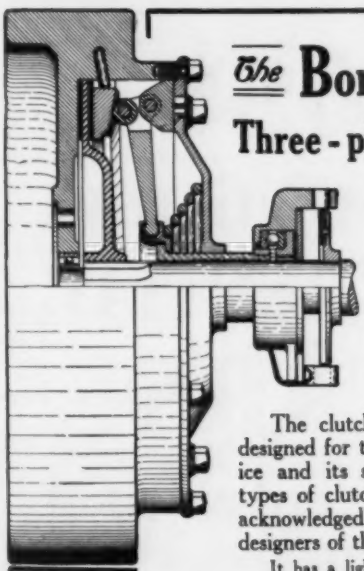
They each have the quality, the ability and the durability to meet the most exacting requirements of the hardest kind of service. Their success has been founded on these important factors.

Quality has been the keynote of construction in every part of the **DeKalb,** and as a result of the correct designing, careful choice of materials and parts and expert workmanship, the **DeKalb** is a model of efficiency and the acme of durability.

DeKalb Trucks sell because of what they do and the way they do it, and repeat orders come because no other truck of its class renders such economical and efficient service. That's why a **DeKalb** agency becomes a permanent business asset.

Good territory is open for capable representatives

DeKalb Wagon Co., DeKalb, Ill.



The Borg & Beck Three-plate dry disc Clutch offers a real solution of the clutch problem

The clutch has been especially designed for truck and tractor service and its superiority over other types of clutch now in use is freely acknowledged by engineers and designers of the highest standing.

It has a light friction disc that will not manifest any drag in releasing. Its engagement is gradual and positive, and it will not grab, stutter or slip. Does away with gear shifting in crowded traffic by means of friction-slippage. Can be slipped indefinitely without damage.

Truck, tractor and automobile makers are invited to write for complete description.

The Borg & Beck Co.

Moline, Ill.

BORG & BECK MOLINE, ILL.

Buys 22 Pierce-Arrow Trucks

United Fuel and Supply Company Orders Big Fleet After Competitive Service Tests

This Detroit Company was at one time the largest owner of horse equipment in the State of Michigan. It later operated eight trucks of four different makes.

In October, 1913, officials of the United Fuel and Supply Company visited the plants of all leading manufacturers of motor trucks. As a result of this investigation they purchased two 5-ton trucks, which were immediately placed in competition with the Company's other motor trucks and horse teams.

Careful records of comparative costs were kept. In general efficiency, low cost of operation and small percentage of idle time the Pierce-Arrow trucks made such a favorable showing that the United Fuel and Supply Company ordered twenty additional Pierce-Arrows, ten for immediate delivery and ten for installation in the late fall of 1914.

In addition to its coal and coke trade the United Fuel and Supply Company does a very large business in sand, gravel, stone, lime, plaster, cement, roofing, pipe, tile and brick. During the building season the motor trucks are employed in hauling these supply materials.

When the trucks were ready to go into service the Pierce-Arrow Motor Car Company put at the disposal of the owners factory-trained experts who took charge of inspection and supervision and also inaugurated a complete and up-to-date system for keeping records and costs. Our experience along these lines is wide and varied and we are at all times prepared to extend this valuable assistance to Pierce-Arrow owners.

The Worm-Gear

All Pierce-Arrow Trucks are equipped with the worm-gear drive, which is a positive guarantee of effective service under the most difficult conditions.

THE PIERCE-ARROW MOTOR CAR COMPANY

BUFFALO NEW YORK

FEDERAL TRUCK in front of the Bigelow-Willey Motor Company of Philadelphia—Federal Dealers for this locality

A VALUABLE ASSET

The Federal agency for your territory is a valuable business asset—your standing as a dealer is largely governed by the service-giving qualities and efficiency of the truck you handle.

The Federal is a proven success—all over the world. Federal Trucks are making daily demonstrations of their economical and dependable service-giving capacity in many different lines of trade.

Federal Dealers are successful because they are selling efficient transportation service—trucks that stay sold and bring in repeat orders.

Backed by the unquestioned manufacturing facilities and financial resources of the Federal Motor Truck Company, you can give your customers the service they demand from Motor Trucks.

The Federal transportation engineering department has valuable data, gained from the results of Federalized Transportation in many different lines of trade, that will enable you to solve the haulage problems of your customers.

Give this matter your serious consideration and let us hear from you about the situation in your territory.

FEDERAL MOTOR TRUCK COMPANY

158 LEAVITT STREET **DETROIT, MICHIGAN**

Sell the KREBS

---the only automatically governed worm-driven truck

That's a remarkably strong argument to advance—and one that goes a long way toward making the sale.

Model G, One-Ton Truck

The automatic governor means an economy of operation that appeals strongly to the prospective buyer. It leaves nothing to chance or to the intelligence and interest of the driver, but compels him to be an economical and efficient driver whether or not he wants to be. He simply steers while the governor runs the car, getting the maximum power from the minimum amount of fuel.

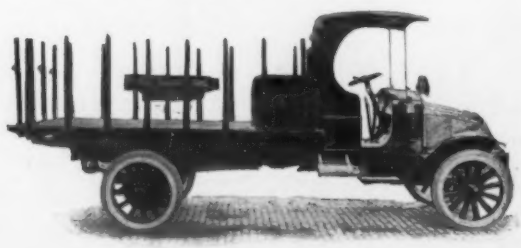
The worm drive means that the truck is silent in operation, is exceptionally powerful and marvelously durable, giving service that, in quality and length, is not possible with any other drive.

The KREBS has the famous Timken-David Brown Worm Drive mounted in a full floating rear axle—which means it has the very best procurable.

Without these features the KREBS is the equal in efficiency and value of any truck of its size built. With them, it is a superior product which you can sell because it offers more advantages than any truck your competitors can produce.

The KREBS is a money maker for dealers—let us submit the proof to you.

Model E, ½-Ton Truck



Model H, 2-Ton Truck

THE KREBS COMMERCIAL CAR COMPANY, Clyde, Ohio

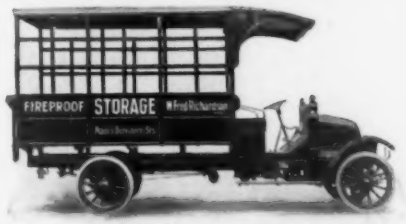
Lippard-Stewart

This fleet averages 50 miles a day delivering bread in the suburbs

A Fleet in New York

THE favorable comment you can create by the excellent appearance of your delivery service is next in importance in your selection of motor trucks to durability of construction and economy in operation. In Lippard-Stewart trucks you will find all these qualities combined through characteristic features of construction. Noiseless, fast, beautiful—they call attention to the efficiency of your methods.

Lippard-Stewart trucks for years have been accepted trucks of proven merit. Today they are operating in over 70 lines of business. Over 40 firms are using two or more, in nearly every case purchasing from one to twelve after the first cars have proven their worth. They are used by the U. S. Parcel Post, by the U. S. Army. They are popular in Omnibus, Patrol, Ambulance work, where quick service, durability and economy are such important factors. You see fleets of them in nearly all leading cities, doing work for newspapers, department stores, general dealers, wholesalers, builders, manufacturers. They have proven their excellence.



W. Fred Richardson, Inc., purchased a 1½ Ton Lippard-Stewart in March, 1914; then a 2 Ton Lippard-Stewart in July, 1914; then a ¾ Ton Lippard-Stewart Combination Hearse for general funeral service, 3 cars of one make, 500 pounds, each different capacities, in six months time after competitive tests with cars of other makes.

For Fast, Economical Service

½ Ton, ¾ Ton, 1 Ton, 1½ Ton, 2 Ton

Note that range of sizes. You are enabled to choose in 500-pound capacities, a fleet of trucks best suited to your requirements. There is no greater waste in the truck field today than the tendency to buy either undercapacity size or overcapacity size; not only a waste in initial cost, but a waste in operating expense.

Ask Us Why We Use

Continental Motor with Automatic Speed Governor; Eisemann Magneto; Brown-Lipe Transmission; Timken Axles and bearings; David Brown Worm Drive (extra above bevel drive on ½ and ¾ ton size); Big Tire Equipment.

Catalog and Special Truck Information Sent On Request

Business Men Write

Write us about your delivery problems. Let us tell you about the responsibility, integrity, and long experience back of Lippard-Stewart trucks, the high business standing of our dealers, and the efficiency of our co-operation with owners.

Radiator at Dash

Our Dealers' Sign

Lippard-Stewart MOTOR TRUCKS

This 1½ ton truck, owned by Sibley, Lindsay & Curr Company, attracts much attention in Rochester, N. Y.

Attention given to particular body requirements.

Great opportunity for Active Dealers in open territory.

LIPPARD-STEWART MOTOR CAR CO., 1737 ELMWOOD AVENUE BUFFALO, N. Y.

Model "M" 1½ Ton Worm-Drive Chassis

MODERN

THE BOWLING GREEN MOTOR CAR COMPANY

CHAIN-DRIVE MODELS

Model "F" 1 Ton

Timken front axle
Timken rear axle
Timken brakes and radius rods
Timken bearings
Continental motor
Bosch magneto
Covert transmission
Russell jack shaft
Barnes steering gear

Chassis in lead—$1500

Model "H" 1½ Ton

Timken front axle
Timken rear axle
Timken jack shaft
Timken brakes and radius rods
Timken bearings
Continental motor
Bosch magneto
20" Barnes steering gear, heavy-duty type

Chassis in lead—$1800

WORM-DRIVE MODELS

Model "L" 1 Ton

Timken David Brown worm-drive rear axle
Timken front axle
Timken bearings thruout
Brown-Lipe transmission with Timken bearings
Continental motor
Bosch magneto
20" Barnes steering gear, heavy-duty type

Chassis in lead—$1750

Model "M" 1½ Ton

Timken David Brown worm-drive rear axle
Timken front axle
Timken bearings thruout
Brown-Lipe transmission with Timken bearings
Continental motor
Bosch magneto
20" Barnes steering gear, heavy-duty type

Chassis in lead—$2000. 5" rear tires
3½" Dual tires in rear, $2100

Dealers Wanted!!

Large honeycomb type radiator with side spring suspension used on all models. All bolts A. L. A. M. thread, cotter-pinned. Castellated nuts.

The Bowling Green Motor Truck Co. *Write for Catalog* **Bowling Green, Ohio**

When Writing, Please Say—"Saw your Ad. in the C C J"

Independent Light Delivery Trucks

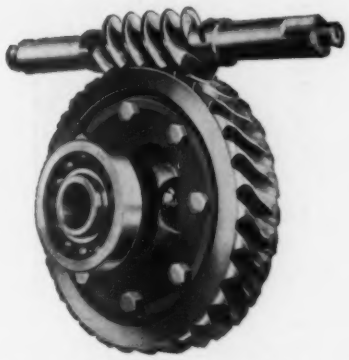
Always on the Job

No Matter What the Job

Worm Drive

The Worm Drive

on this truck is practically indestructible, and will give service of 50,000 to 100,000 miles with no diminution of efficiency. Absolutely silent,—its parts few and strong, and completely protected from dust and dirt,—it is the ultimate choice of the well-posted buyer of motor trucks.



Dealers

We want responsible dealers for this truck. It is high grade in every particular, and finds a ready sale in every business where the delivery of goods is a factor. Our proposition is an attractive one. Write for full particulars.

The field for these Light Delivery Trucks is unlimited. Practically every business house which hauls or delivers goods can profitably use a truck of this class, and is in the market for one or more now, or will be in the near future.

The INDEPENDENT Model "F" is startling in the completeness of its details and its efficiency. It is designed and constructed throughout by successful motor truck engineers—men who have specialized on delivery problems, and is built in a factory devoted exclusively to motor truck building.

Price, Chassis Only, $1275

We also build the Cass Model "E," 1½-Ton Truck, selling for $1850. Write for complete specifications.

Independent Motors Company

Incorporated

Port Huron **Michigan**

VIM DELIVERY CARS

1000 Lbs. Capacity

$635.00

With one exception the largest production of delivery cars in the United States, accomplished in less than a year.

The price of $635 for complete car, comprising the described well-known strictly truck units, has made the VIM to the Commercial Car business what Ford is to the Pleasure Car field. We believe competition with VIM will be slow, for we have a smaller profit than has probably been allowed in any motor enterprise, and our production is large.

Quick success of dealers throughout the country in the One Virgin Field in Automobile Industry

The tremendous business done everywhere in a well-known low-priced pleasure car with delivery body equipment demonstrated the great selling possibilities of a light delivery car; the VIM, with TRUCK ABUSE FACTORS (from radiator to rear axle), is the first car built to meet this big demand, and with qualifications for handling dead loads in ten hour a day service, at a price inviting to all. Considering the enormous demand for this type vehicle, there is no mystery about the success of VIM Dealers; the absence of competition, the well-known truck parts and the price, made that success immediate. A feature of typical VIM success in the "show-me" city of St. Louis is recorded in the following sworn statement by our St. Louis representative, who, additional to regular Sales Agency business, has increased the parcel delivery service to now what is a fleet of fourteen VIM cars. Observation and records of VIM performance in this service gained for us the parcel-post order.

One of Eight Parcel-Post Cars Shipped to St. Louis, September 23d

Robinson Motor Car Co.

Lindell 5540
Delmar 2050

3730-42 SULLIVAN AVE

Days	Miles traveled	Miles per day	Gallons Gasoline	Miles per gal.
52	4412	84.80	221	19.96
52	3939	75.75	190	20.73
52	4430	85.20	226	19.60
156)	12781	3)245.75	637	3)160.29
	81.92	81.92		20.09

Polarine Oil	Miles per gal.	Stops
		Approx.
		52)32570
12.5	352.96	1627
11.5	342.52	209
13.	340.76	Average stops
36	3)1036.24	per day per
	345.41	car.

This is to certify that the above figures are correct and accurately represent the miles traveled and the consumption of gasoline and oil by the three VIM cars put into the Parcel Delivery Service by us on June 1, 1914, and covers the 52 working days in June and July.

These three cars were driven 12,781 miles or an average of 81.92 miles per day. They consumed 637 gallons of gasoline and made a general average of 20.09 miles per gallon. They used 36 gallons of Polarine Oil and made an average of 345.41 miles per gallon of oil. The three cars made approximately 32,570 stops or an average of 209 stops per day for each car.

Signed ROBINSON MOTOR CAR CO.,
Per U. G. Robinson

Subscribed and sworn to before me this 25th day of August, 1914.

Bertha E. Robinson
Notary Public.

My commission expires Jan. 16, 1915.

Principal Vim Specifications

Northway Motor & Manufacturing Co.'s 15-20 H. P. 4 cylinder water-cooled Truck motor, 2" three-bearing crank shaft.
Northway 30-35 H. P. three-speed sliding-gear transmission.
Northway 30-35 H. P. cone clutch.
Weston-Mott 30 H. P. axles, Brown-Lipe differential.
Hartford 35-40 Dust-proof Universal Joint.
Parrish Manufacturing Co. pressed-steel frame.
Schwarz wheels. All steel, electrically welded bodies.
Firestone, Goodyear or U. S. Tires.

The Touraine Mfg. Co., Main Office and Factory, Broad and Huntingdon Sts., Philadelphia

Demonstrating and exhibition cars in agencies in New York, Boston, Chicago, St. Louis, Detroit, Dallas, San Francisco, Los Angeles, Seattle, Minneapolis, Norfolk, Pittsburgh, Cleveland and fifty-two other cities

Advertisers' Index

EISEMANN

Just as additional evidence of the continued supremacy of Eisemann Ignition, especially in the motor truck field, we cite the fact herewith that at the last count of the 83 concerns with whom we have contracts for standard equipment, 50 of them were contracts with motor truck manufacturers.

As we have often repeated, this simply bears out our contention, that where efficiency, dependability and durability count most, there you will find Eisemann most firmly entrenched.

In other words, Eisemann Magnetos are not only a sales asset, but to the manufacturer of motor trucks who must sell on a cost-of-service basis, Eisemann Magnetos are the biggest sort of service asset as well.

So far as the truck field is concerned, the assertion is truthfully made, that no instrument is so particularly adapted as the Eisemann Magneto with automatic spark control. By the very nature of its design and construction, the automatic spark control Eisemann Magneto means more mileage per gallon of gas and oil, and greatly increased life both of engine and car itself.

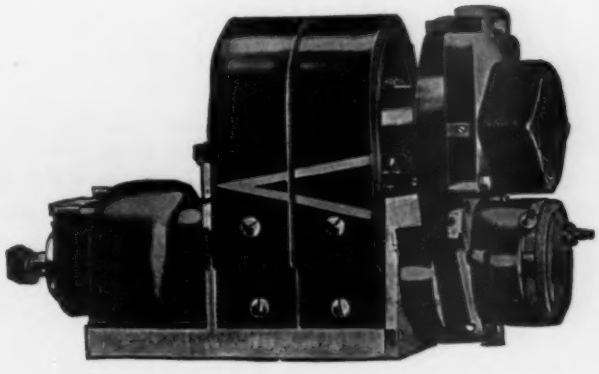
If you are not familiar with this particular type of Eisemann Magneto, the story will interest you. Won't you send for it?

Fifty Truck Makers Now Use Eisemann Ignition.

The Eisemann Magneto Co.

Sales and General Offices
32--33d St., Brooklyn, N.Y.

New York	Indianapolis, Ind.	Detroit, Mich.
123 W. 52d St.	514 N. Capitol Ave.	802 Woodward Ave.



COVERS THE CONTINENT

J-M ACCESSORIES for Commercial Cars

Proven products liberally guaranteed and sold *plus* the assurance of efficient, trustworthy Service that insures each purchaser the attention rightly due him *after* sale.

COVERS THE CONTINENT

$10 *First cost the only cost*

Model "JS"

Spare the Brakes and Use the Horn

With your truck a block or two away, traffic receives an unmistakable warning of your approach from the lusty-voiced and able-bodied

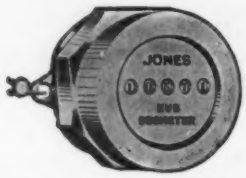
LONG HORN

INVENTED BY C. F. LONG

Its warning note is powerful, penetrating, assertive, demanding right of way—and getting it.

The Long Horn costs you nothing to use no matter how often you use it. It is not a "current eater." Instead it operates conveniently by hand or elbow without conscious effort. The Long Horn gives you the absolute certainty of instant response the very moment needed. Built strong to stand the "gaff" of truck service. Lasts for years. Sold by all good dealers!

Write for booklet



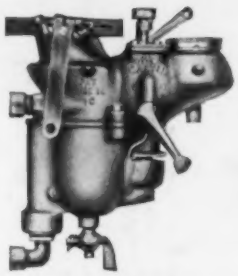
A Necessity to Economy in Truck Maintenance

The mile is the accepted cost-unit for figuring fuel costs, tire costs and every other item entering into truck maintenance. You have at once the simplest and most accurate mileage recorder made, in the

JONES
HUB ODOMETER

Replaces the regular hub cap. Records backward as well as forward wheel travel. Impossible to tamper with because it is sealed permanently when attached. Fits all standard makes of motor trucks. In ordering, specify make of truck, year built, model number or letter, also wheel diameter and, if possible, actual wheel travel through one revolution. Price $20 at all good dealers.

Write for booklet



Neither Promises Nor Claims But Guaranteed Results

The H. W. Johns-Manville Company guarantee every user more power, more flexibility and more economy from the

Carter
CARBURETOR
(Multiple-Jet)

More Power because fuel vaporization is complete.

More Flexibility because fuel flow is automatically controlled by engine speed.

And for both of these reasons **More Economy.**

In addition to unconditionally guaranteeing these results, Johns-Manville assume full responsibility for every user's satisfaction as long as the Carter remains on his car. J-M Service Branches in every important city of North America are always at the disposal of Carter users.

Write for booklet

OTHER J-M ACCESSORIES FOR COMMERCIAL CARS

J-M (Mezger) Soot-Proof Spark Plug **J-M Non-Burn Brake Lining** **J-M Dry Batteries** **J-M Automobile Tape**

Write nearest Branch for booklets

H·W·JOHNS-MANVILLE CO·

SERVICE BRANCHES

Akron	Birmingham	Cincinnati	Dayton	Galveston	Kansas City	Milwaukee	New York	Portland, Ore.	Salt Lake City	Toledo
Albany	Boston	Cleveland	Denver	Houghton	Los Angeles	Minneapolis	Omaha	Rochester	San Francisco	Washington
Atlanta	Buffalo	Columbus	Detroit	Houston	Louisville	Newark, N.J.	Philadelphia	St. Louis	Seattle	Wilkes-Barre
Baltimore	Chicago	Dallas	Duluth	Indianapolis	Memphis	New Orleans	Pittsburgh	St. Paul	Syracuse	Youngstown

SERVICE BRANCHES

THE CANADIAN H. W. JOHNS-MANVILLE CO., Ltd., Toronto, Montreal, Winnipeg, Vancouver

2772